C21.5:1059/5

Vol. 1059 Number 5 260

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

The University of Michigan Engineering Library

Route to:

PATENTS

October 29, 1985

UNIVERSITY OF MICHIGAN LIBRARIES
NOV 21 1985
DEPOSITED BY

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

October 29, 1985 Volume 1059 Number 5

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1059 OG 36
Board of Appeals Decisions Rendered	1059 OG 36
Notice of Maintenance Fees Payable	1059 OG 36
Reissue Applications Filed	1059 OG 37
Requests for Reexaminations Filed	1059 OG 37
Registration to Practice	1059 OG 37
PTO Status	1059 OG 38
Patent Certificates of Correction	1059 OG 40
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1059 OG 41
Condition of Patent Applications	1059 OG 42
Reissue Patents Granted (32,013)	1979
Plant Patents Granted (5,577)	1981
Patents Granted	
General and Mechanical (4,549,315)	1983
Chemical (4,549,880)	2181
Electrical (4,550,219)	2279
Design Patents Granted (281,115)	2357
Index of Patentees	PI 1
Indices of Reissue, Design and Plant Patentees	PI 44
Classification of	
Patents (Including Reissues)	PI 47
Designs and Plants	PI 49
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 50
Designs and Plants	PI 51
Change of Address Form and Subscription Order Form	Back Page

THE UNIVERSITY OF MICHIGAN DEC 1 1985 ENGINEERING LIBRARY

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office has been changed as of Oct. 12, 1985 and is announced in the *Official Gazette* at 1058 O.G. 26 on Sept. 24, 1985.

International PCT fees have been changed effective Oct. 29, 1985 and were announced in the *PCT Gazette* on Aug. 29, 1985 and in the *Official Gazette* at 1058 O.G. 26 on Sept. 24, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee:	
if paid before Oct. 5, 1985	$ 125.00
if paid on or after Oct. 7, 1985	170.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed:	
if paid before Oct. 5, 1985	500.00
if paid on or after Oct. 7, 1985	420.00
—Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
if paid before Oct. 12, 1985	680.00
if paid on or after Oct. 15, 1985	750.00
International fees	
Basic fee (first 30 pages):	
if paid before Oct. 29, 1985	230.00
if paid on or after Oct. 29, 1985	280.00
Basic Supplemental fee (for each page over 30):	
if paid before Oct. 29, 1985	4.00
if paid on or after Oct. 29, 1985	6.00
Designation fee (for the first 10 national or regional offices):	
if paid before Oct. 29, 1985	55.00
if paid on or after Oct. 29, 1985	70.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

Aug. 28, 1985.

Board of Appeals Decisions Rendered in the Month of Sept. 1985

Affirmed	221
Affirmed in Part	38
Reversed	96
Total	355

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Oct. 26, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,355,424 through 4,356,568
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges, as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,116,785, Re. S.N. 775,195, Filed Sept. 12, 1985, Cl. 204/159.14, PHOSPHONITRILIC POLYMERS WITH CURABILITY BY SULFUR ACCELERATED CURES OR RADIATION CURES, Tai Chung Cheng, Owner of Record: *Firestone Tire & Rubber Co., Akron, Ohio,* Attorney or Agent: David A. Thomas, Ex. Gp.: 112

4,394,645, Re. S.N. 757,012, Filed July 19, 1985, Cl. 340/572, ELECTRICAL SURVEILLANCE APPARATUS WITH MOVEABLE ANTENNA ELEMENTS, David R. Humble, et al., Owner of Record: *Sensormatic Electronics Corp., Deerfield Beach, Fla.,* Attorney or Agent: Herbert Blecker, et al., Ex. Gp.: 268

4,398,299, Re. S.N. 762,761, Filed Aug. 5, 1985, Cl. 375/008, DATA SET NETWORK DIAGNOSTIC SYSTEM, Donald W. Darling, et al., Owner of Record: *Bell Telephone Laboratories, Inc., Murray Hill, N.J.,* Attorney or Agent: Roy C. Lipton, Ex. Gp.: 263

4,400,719, Re. S.N. 768,739, Filed Aug. 23, 1985, Cl. 358/21R, TELEVISION DISPLAY SYSTEM WITH REDUCED LINE-SCAN ARTIFACTS, Kerns H. Powers, Owner of Record: *RCA Corp., Princeton, N.J.,* Attorney or Agent: Eugene M. Whitacre, et al., Ex. Gp.: 262

4,400,829, Re. S.N. 770,855, Filed Jan. 8, 1982, Cl. 2/016, PROTECTIVE FOOTBALL GLOVE, John R. Willis, Owner of Record: *Inventor,* Attorney or Agent: Scott W. Kelley, et al., Ex. Gp.: 247

4,411,127, Re. S.N. 773,751, Filed Sept. 6, 1985, Cl. 56/364, FLOATING WINDGUARD, Anthony F. Diederich, Jr., Owner of Record: *Sperry Corp., New Holland, Pa.,* Attorney or Agent: Frank A. Seemar, Ex. Gp.: 333

4,440,566, Re. S.N. 771,086, Filed Aug. 30, 1985, Cl. 71/098, HERBICIDAL SUBSTITUTED 2-(1-(OXYAMINO)ALKYLIDENE)-CYCLOHEXANE-1,3-DIONES, Tatao Luo, Owner of Record: *Chevron Research Co., San Francisco, Calif.,* Attorney or Agent: J. A. Buchanan, Jr., et al., Ex. Gp.: 129

4,469,908, Re. S.N. 770,942, Filed Aug. 30, 1985, Cl. 585/467, ALKYLATION OF AROMATIC HYDROCARBONS, George T. Burress, Owner of Record: *Mobil Oil Corp., New York, N.Y.,* Attorney or Agent: Alexander J. McKillop, et al., Ex. Gp.: 116

4,488,275, Re. S.N. 752,437, Filed July 8, 1985, Cl. 369/044, TRACKING SYSTEM FOR VIDEO DISC PLAYER, Ludwig Ceshkovsky, et al., Owner of Record: *Discovision Associates, Costa Mesa, Calif.,* Attorney or Agent: Ronald J. Clark, Ex. Gp.: 235

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,178,018, Reexam. No. 90/000,858, Requested: Sept. 17, 1985, Cl. 282/11.5A, CONTINUOUS STATIONARY ASSEMBLIES, Per W. Halse, Owner of Record: *Moore Business Forms, Inc., Niagara Falls, N.Y.,* Attorney or Agent: Cushman, Darby, et al., Ex. Gp.: 327, Requester: Moore Business Forms, Inc., Washington, D.C.

4,199,190, Reexam. No. 90/000,866, Requested: Sept. 20, 1985, Cl. 297/468, DEVICE FOR USE IN CONNECTION WITH SAFETY BELTS, Stig M. Lindblad, Owner of Record: *Safety Transport Inter Development AB, Anderstorp, Sweden,* Attorney or Agent: Robert Osann, Ex. Gp.: 357, Requester: TRW, Inc., Cleveland, Ohio

4,474,208, Reexam. No. 90/000,868, Requested: Sept. 23, 1985, Cl. 137/516.29, SAFETY VALVE, Raymond H. Looney, Owner of Record: *Baird Manufacturing Co., Tulsa, Okla.,* Attorney or Agent: Head, Johnson, et al., Ex. Gp.: 347, Requester: Taylor Oil Tools, Inc., Oklahoma City, Okla.

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of any of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before Nov. 18, 1985:

Brouilette, Robert, LaPointe Rosenstein, Place Sherbrooke, 1010 Sherbrooke St., W. Montreal, Quebec, Canada H3A 2R7.
Brown, Scott L., 603 S. 23rd St., Arlington, Va. 22202.
Cannon, Kenneth A., 5421 Harvard, Bartlesville, Okla. 74004.
Dixson, William T., Jr., 111 Caldwell St., McMinnville, Tenn. 37110.
Gold, Elijah H., 10 Roosevelt Ave., Orange, N.J. 07052.
Maslousky, Paul E., 1512 Hughes Rd., Adelphi, Md. 20783.
Simenauer, Jeffrey A., 11321 Mitscher St., Kensington, Md. 20895.

Oct. 2, 1985.

CAMERON WEIFFENBACH,
Director, Office of
Enrollment and Discipline.

Status of PTO Services

The following is an update of the status of PTO services for September 1985:

Service Item	FY 1985 Performance Goal (Calendar Days)	Monthly Average	Comment
Filing Receipts:			
Patents	22	20	
Trademarks	30	38	Reduced by 3 days since last month.
Patent/Trademark Copies:			
Special Window Coupons	1*	93% within 1 day	
Window Coupons	5	98% within 5 days	
Mail Coupons	29 (26)*	99% within 26 days**	
Letter Orders	34 (26)*	99% within 26 days**	
Date of oldest unfilled order		Sept. 16, 1985	
Current Mail Date being processed		Sept. 26, 1985	
Certified Copies:			
Trademark Registrations	30	31	
Applications-As-Filed	20 (10)*	99% within 7 days	
File-Wrapper/Contents	N/A	96% within 7 days	
Walk-up Certification	1	99% within 24 hours	
Trademark Search Library:			
Filing Pending Marks	21	27	Reduced by 8 days since last month.
Filing Reg. Certificates	3 (Issue Date)*	On schedule	
Assignments:			
Patents	25 (20)*	16	
Trademarks	25 (20)*	16	
Avg. Days from Issue Fee Payment to Issue Date	90–100	88	
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	On schedule	
Patent Official Gazette:			
In Bookstore	Issue Date	On schedule	
Mailed	Issue Date	On schedule	
Patent Grants Mailed	Issue Date	1 day late	
Trademark Official Gazette:			
In Bookstore	Issue Date	On schedule	
Mailed	Issue Date	On schedule	
Trademark Regs. Mailed	Issue Date	3 days late	Delayed to account for all withdrawals.
Patent Copies Available	Issue Date	92% on Issue Date	
Trademark Copies Available	Issue Date	99% on Issue Date	

*Reflects new goal for faster service.
**Figures include postal processing and delivery time.

IMPROVEMENTS IN SERVICES

- *Patent File Histories* — The approximately 725,00 patent file histories stored at the Eads Street File Repository were screened in order to maximize their integrity. Only about one tenth of one percent were discovered out of sequence — an indication of the high level of performance of the files maintenance contractor. Twelve official searches were resolved as a result of this effort.

- *Assignment Search Room* — The remodeling of the Assignment Search Room has been completed. A larger and quieter facility is now available to all members of the public.

- *Help Us Help You Campaign* — Due to the success of this campaign, posters and boxes, which had previously been only in the service areas, are now being located throughout the patent and trademark examination areas. Over the past year, about 80% of the comments received praised PTO employees by name for the excellent service rendered. These "pats on the back," which are greatly appreciated, have heightened employee awareness of the importance of the service they render. The other comments pointed out problems or suggestions which could be quickly resolved by the supervisor and result in improved service. All of this is really helping us help you!

HELPFUL HINTS FROM THE PTO

- *Submission of Drawings* — For your convenience and for more effective handling of any drawing corrections which may be necessary, please DO NOT SUBMIT ORIGINAL DRAWINGS WITH PATENT APPLICATIONS. DO SUBMIT THREE HIGH QUALITY COPIES. If the copies submitted pass the formality review and patent examination, no substitute drawings will be necessary. If corrections are necessary, they should be made to the original drawings. Either a good copy of the corrected drawings or the corrected original can then be submitted after the Notice of Allowability is mailed.

- *Reissue Amendments* — In order to avoid unnecessary delays in the issuance of reissue applications, applicants and their attorneys are reminded to exercise caution and give sufficient attention to 37 CFR 1.121(a) and (e) in presenting reissue amendments to the PTO. The practices and procedures vary somewhat from regular utility application amendments, and this frequently causes clerical problems and editorial revisions. MPEP Sec. 1455 provides guidance for proper entry of amendments and claim numbering. Publication of the reissue application(s) may be needlessly postponed while formal irregularities are corrected.

- *Returning Files to the File Information Unit (FIU)* — As follow-up to a previously indentified problem involving FIU file histories being left in the Public Search Room rather than being returned as required, all charge cards were monitored for a three week period.
  Of the 2,011 files obtained, a total of 32 were not properly returned. Although the percentage of abuse is not great, customers are again reminded that files obtained through the FIU are official government records which must be returned by 7:45 p.m. on the same day they are obtained. Additionally, files obtained through the FIU shall not be removed from the confines of the Public Search Room at any time.
  FIU personnel will continue to periodically monitor this problem. Should individual patterns of abuse be discerned, administrative sanctions up to termination of access privileges will be applied.

Oct. 7, 1985.

THERESA A. BRELSFORD,
Assistant Commissioner
for Administration.

PATENT NOTICES

Certificates of Correction for the Week of Oct. 29, 1985

PP. 5,319	4,489,573	4,515,617	4,525,812
PP. 5,464	4,489,817	4,516,859	4,526,026
Re. 31,945	4,490,453	4,517,131	4,526,166
4,104,248	4,491,444	4,517,327	4,526,247
4,149,944	4,496,631	4,518,217	4,526,770
4,260,360	4,496,945	4,518,397	4,526,833
4,270,141	4,497,020	4,518,870	4,526,900
4,294,507	4,497,874	4,519,004	4,527,077
4,330,708	4,498,187	4,519,101	4,527,166
4,376,729	4,499,372	4,519,810	4,527,369
4,389,718	4,500,103	4,520,184	4,527,515
4,406,661	4,500,691	4,520,276	4,527,738
4,416,831	4,501,009	4,521,074	4,527,777
4,419,344	4,501,530	4,521,597	4,527,820
4,423,452	4,502,110	4,521,633	4,527,966
4,427,665	4,502,756	4,521,703	4,528,272
4,427,696	4,502,994	4,521,907	4,528,538
4,433,215	4,503,761	4,522,261	4,528,574
4,434,103	4,503,824	4,522,267	4,528,889
4,444,530	4,503,880	4,522,333	4,528,917
4,450,796	4,505,817	4,522,562	4,529,039
4,454,318	4,507,206	4,522,629	4,529,126
4,457,847	4,507,401	4,522,763	4,529,452
4,460,989	4,507,455	4,522,893	4,529,561
4,463,045	4,507,465	4,522,950	4,530,150
4,463,756	4,507,648	4,523,047	4,531,343
4,463,825	4,508,570	4,523,104	4,531,510
4,472,428	4,508,987	4,523,151	4,531,559
4,473,717	4,509,389	4,523,161	4,532,045
4,476,426	4,509,403	4,523,232	4,532,120
4,476,588	4,509,497	4,523,353	4,532,338
4,477,055	4,509,796	4,523,437	4,532,495
4,477,071	4,510,044	4,523,591	4,532,538
4,478,935	4,510,166	4,523,596	4,532,988
4,479,315	4,510,183	4,523,819	4,533,314
4,482,423	4,510,756	4,523,986	4,533,717
4,484,569	4,510,758	4,524,321	4,534,168
4,485,835	4,511,746	4,524,423	4,534,470
4,486,414	4,511,888	4,524,629	4,534,508
4,486,521	4,512,195	4,524,756	4,535,258
4,486,597	4,513,089	4,525,062	4,535,553
4,486,854	4,513,286	4,525,367	4,536,115
4,488,703	4,513,597	4,525,479	4,537,739
4,488,882	4,514,293	4,525,567	4,537,901
4,489,344	4,514,409	4,525,607	4,539,282

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 451-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas.	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF September 30, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	12-28-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	6-01-83
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-12-84
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	6-07-84
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	9-30-83
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	3-21-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	11-21-83
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—E. E. KUBASIEWICZ, Director	6-05-84
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	3-28-83
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	8-30-83
DESIGN, GROUP 290—K. L. CAGE, Director	3-07-83
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	8-29-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-10-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	6-27-83
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-02-84

Expiration of patents: The patents within the range of numbers indicated below expire during September 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,399,406 to 3,403,405, inclusive

Plant Patents . . . . . Numbers 2,830 to 2,834 inclusive

REISSUES

OCTOBER 29, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

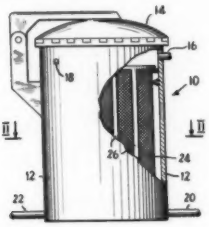
Re. 32,013
EXPANDING TOBACCO

Roger Z. de la Burde, Powhatan, and Patrick E. Aument, Richmond, both of Va., assignors to Philip Morris, Inc., New York, N.Y.

Original No. 4,340,073, dated Jul. 20, 1982, Ser. No. 441,767, Feb. 12, 1974. Application for reissue Jun. 28, 1984, Ser. No. 625,404

Int. Cl.⁴ A24B *3/18*

U.S. Cl. 131—291 **31 Claims**



27. A process for expanding tobacco comprising:

(a) impregnating the tobacco with liquid carbon dioxide;

(b) subjecting the impregnated tobacco to conditions such that a portion of the liquid carbon dioxide is converted to a solid form; and

(c) thereafter subjecting the tobacco to conditions such that the tobacco is expanded.

Re. 32,014
PROCESS FOR EXPANDING TOBACCO

Larry M. Sykes, Midlothian; Ray G. Snow, Richmond; Roger Z. de la Burde, Powhatan, and Patrick E. Aument, Richmond, all of Va., assignors to Philip Morris, Inc., New York, N.Y.

Original No. 4,336,814, dated Jun. 29, 1982, Ser. No. 72,647, Sep. 5, 1979. Continuation of Ser. No. 822,793, Aug. 8, 1977, abandoned. Application for reissue Jun. 28, 1984, Ser. No. 626,190

Int. Cl.⁴ A24B *3/18*

U.S. Cl. 131—291 **12 Claims**

7. In a method of expanding tobacco comprising the steps of (1) impregnating the tobacco with liquid carbon dioxide, (2) subjecting the impregnated tobacco to conditions such that a portion of the liquid carbon dioxide is converted to solid form, and (3) thereafter subjecting the tobacco to conditions such that the tobacco is expanded, the improvement comprising:

(a) utilizing as the tobacco which is employed in step (1) a tobacco which has an OV content of from about 17% to about 30%;

(b) conducting the liquid contact step under pressure in the range of from about 250 psia to about 450 psia; and

(c) conducting the expansion step in such a manner that the moisture content of the expanded tobacco is no higher than about 6%.

Re. 32,015
PROCESS FOR THE MANUFACTURE OF INSULIN, ANALOGS AND DERIVATIVES THEREOF

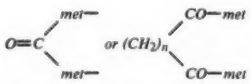
Rolf Geiger, Frankfurt am Main, and Rainer Obermeier, Hattersheim am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Original No. 4,014,861, dated Mar. 29, 1977, Ser. No. 585,604, Jun. 10, 1975. Application for reissue Mar. 22, 1979, Ser. No. 22,852

Int. Cl.⁴ C07C *103/52*

U.S. Cl. 260—112.7 **4 Claims**

4. A method for making an insulin compound which comprises reacting an A-chain fragment of insulin, a B-chain fragment of insulin, and an activated ester of a bridging agent of the formula



where met is methionine and n is an integer from 1 to 4, oxidizing the resulting compound to form disulfide crosslinks between the A-chain and B-chain, and then treating the product with cyano bromide in an acid medium.

Re. 32,016
ANALYSIS OF LACTIC ACID OR LACTATE USING LACTATE OXIDASE

Theodore W. Esders, Webster; Charles T. Goodhue, Rochester, and Richard M. Schubert, Spencerport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Original No. 4,166,763, dated Sep. 4, 1979, Ser. No. 749,546, Dec. 10, 1976. Application for reissue Aug. 31, 1981, Ser. No. 297,675

Int. Cl.⁴ C12Q *1/26, 1/28;* **C12N** *9/02;* **C12R** *1/46*

U.S. Cl. 435—28 **29 Claims**

28. An enzyme lactate oxidase having at least the following substrate specificity and enzyme action:

substrate specificity: L-lactic acid enzyme action: catalyzes the reaction L-lactic acid + O_2 → pyruvic acid + H_2O_2 wherein said enzyme lactate oxidase (1) is capable of effecting the production of detectable hydrogen peroxide, (2) has a specific activity of at least about 0.1μ mole lactate per minute per mg. of protein, (3) is soluble in water, (4) is substantially catalase-free, and (5) has a K_m for lactate of at least about 0.2 mM.

PLANT PATENTS

GRANTED OCTOBER 29, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,577

ROSE PLANT JACSMI

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Nov. 7, 1983, Ser. No. 549,298

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—8 **1 Claim**

1. A new and distinct variety of rose plant of the miniature class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its dwarf plant, resistance to rose powdery mildew, short yellow buds and very double yellow flowers.

5,578

ROSE PLANT JACOUCH

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Dec. 2, 1983, Ser. No. 557,199

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of rose plant of the miniature class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its clusters of salmon pink blooms, stiff petal substance, lack of fragrance and resistance to rose powdery mildew.

PATENTS

GRANTED OCT. 29, 1985

ERRATA

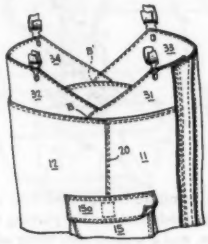
For CLASS	See PATENT NO.
623–044	4,549,318
623–022	4,549,319
004–301	4,549,321
227–008	4,549,681
227–119	4,549,682
004–453	4,549,882
172–158	4,550,122

PATENTS

GRANTED OCTOBER 29, 1985

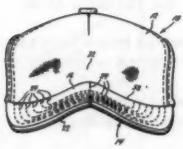
GENERAL AND MECHANICAL

4,549,315
FIREMAN'S BIB OVERALL
Raymond English, Lebanon, and Michael Towle, Pittsfield, both of N.H., assignors to Globe Manufacturing Co., Pittsfield, N.H.
Filed Jun. 11, 1984, Ser. No. 619,124
Int. Cl.[4] A41D *13/00, 1/06, 11/00*
U.S. Cl. 2—2 **8 Claims**



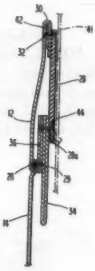
1. A heat-resistant bib overall which can be used as part of a fireman's suit, said bib overall comprising a trouser portion and a bib portion, said trouser portion providing a high waistband and right and left outer (side) seams, said bib portion comprising a right front bib section, a left front bib section and a rear bib section, each of said bib sections having a lower horizontal edge which is continuously sewn along its length to said high waistband, said rear bib section extending forwardly to said respective right and left outer (side) seams and said right and left front bib sections extending rearwardly of said respective right and left outer (side) seams, such that said front right and front left bib sections will overlap said rear bib section along the respective right and left sides of said bib overall.

4,549,316
FOLDABLE HAT
Kenneth L. Johnson, Kansas City, Kans., assignor to Capmakers, Ltd., Kansas City, Mo.
Filed Oct. 31, 1983, Ser. No. 547,327
Int. Cl.[4] A42B *1/20*
U.S. Cl. 2—195 **13 Claims**



2. A foldable hat comprising a body portion for placement of the hat on the head of the wearer and a visor portion, said visor portion having an upper fabric layer, a lower fabric layer, and a stiffening layer therebetween, said stiffening layer being substantially coextensive with said visor portion and having a rearward edge substantially coextensive with the line of connection between the body and visor portions, said visor further having a front edge, said visor portion further having at least one pre-formed fold line at an intermediate location extending from the rear edge to the front edge of the visor portion, said fold line having stitching therealong, said visor portion being foldable along said fold line, whereby placement of the hat on the head urges the visor portion to unfold along the fold line.

4,549,317
GARMENT WAISTBAND CONSTRUCTION
Anthony H. D'Ambrosio, 10th St. and Godfrey Ave., Philadelphia, Pa. 19126
Filed Feb. 10, 1983, Ser. No. 465,472
Int. Cl.[4] A41F *9/02*
U.S. Cl. 2—237 **8 Claims**

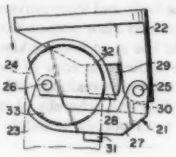


1. A waistband assembly for a garment comprising a waistband of a fabric material turned over at its upper extremity to form a bight with a small inner flap depending therefrom, an elastic strip of one piece construction having an upper portion which is longitudinally elastic including means substantially preventing transverse bending of said upper portion whereby to exhibit no roll characteristics, said upper portion being positioned adjacent to and sewn to the side of said inner flap, facing inwardly to the wearer away from said waistband at the top of said strip, and a curtain depending from the lower portion of said elastic strip and sewn thereto on the side of said elastic strip facing outwardly towards said outer garment, whereby the entire width of said elastic band is exposed to a garment worn simultaneously with a garment comprising said waistband assembly.

4,549,318
PROSTHETIC DEVICE WITH A KNEE MECHANISM
Itsuro Takahama, 5-27-8, Hanazono, Kumamoto-shi, Kumamoto-ken, Japan
Filed Jan. 29, 1985, Ser. No. 696,190
Int. Cl.[4] A61F *1/04, 1/08*
U.S. Cl. 623—44 **2 Claims**

1. A prosthetic device comprising a thigh element, a shank element and a knee mechanism jointedly connecting said elements, the knee mechanism including two discs having a large diameter disposed at the opposite sides of the thigh element and secured to the shank element, an upper gripping member including two arcuate surfaces of a diameter slightly larger than that of said discs and disposed around the upper circumferential surfaces of said discs, and a lower gripping member

including two arcuate surfaces of a diameter slightly larger than that of said discs and disposed around the lower circumferential surfaces of said discs, said upper and lower gripping members being pivotably interconnected about a horizontal axis toward the back of the user of the prosthetic device, said thigh element being pivotably connected to said lower gripping member about a horizontal axis toward the front of the user, so that, when said thigh element pivots backwards with respect to the user, it presses the upper gripping member downwards and lifts up the lower gripping member for frictional engagement of said arcuate surfaces of these gripping members with said discs.



4,549,319

ARTIFICIAL JOINT FIXATION TO BONE

Benjamin S. Meyer, Birmingham, Ala., assignor to United States Medical Corporation, Washington, D.C.

Filed Aug. 3, 1982, Ser. No. 404,774
Int. Cl.⁴ A61F *1/04*
U.S. Cl. 623—22 **7 Claims**

1. A joint prosthesis component means for fixation to bone, comprising:

first means defining a joint motion surface;

a stem attached to said first means defining a joint motion surface for extending into the central canal of the bone into which the component means is to be fixed;

that part of the prosthesis component means which is intended to be located within the bone at the end of bone near the joint motion surface defining an external geometric pattern of elongated projections spaced circumferentially around said prosthesis component means which engage with the bone when implanted in the bone, said elongated projections having a thickness of from about 0.5 mm to about 2.0 mm, a height of at least about 0.7 mm, a spacing of from about 1 mm to about 4 mm and an effective length at least ten times their thickness; and

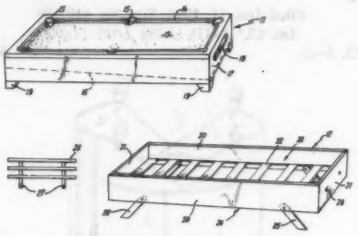
the effective length of said external geometric pattern of elongated projections is less than one half of that portion of the prosthesis component means which is intended to be implanted within the bone.

4,549,320

CONVERTIBLE FURNITURE

James F. McGivern, Accrington, England, assignor to Beconpatch Limited, Macclesfield, England

Filed Jun. 26, 1984, Ser. No. 624,597
Int. Cl.⁴ A47B *83/00, 85/00*
U.S. Cl. 5—2 R **3 Claims**



1. Convertible furniture comprising two parts, a first part having a top surface adapted for the playing of snooker or the like game thereon, and a second part being adapted to receive a mattress thereon, said two parts being adapted to be interchangeably located one above the other; each part being of like rectangular planform, having a respective lower surface and four corners thereof, and comprising a leg adjacent each corner of said respective lower surface; wherein each leg of said second part is mounted so as to be pivotal between an operative position in which said leg supports said second part and an inoperative position in which it lies substantially parallel with said lower surface of said second part.

4,549,321

URINAL

Roger Douillard, 66 Columbus Ave., Valhalla, N.Y. 10595

Filed Mar. 18, 1985, Ser. No. 712,717
Int. Cl.⁴ E03D *13/00*
U.S. Cl. 4—301 **8 Claims**

1. A urinal mounted in a hinged toilet seat cover and extensible from an aperture therein comprising a collapsible funnel-shaped urinal,

a pivotal lever having a gear section at one end mounted to the seat and extending along the forward portion of the seat,

a gear system within the cover engaged by the gear section of the lever,

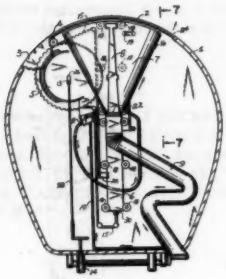
a carrier coupled to the rear of the urinal and including a waste line coupled thereto and an extender arm mounted to the urinal to project it outwardly from the seat and into a funnel shape and means to lock the urinal in position,

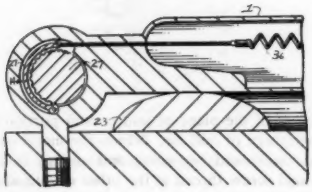
means coupled to the gear system engaging the cover hinge to lock the cover in a raised position,

pulley means connected to the gear system at one end and to the carrier to drive the carrier back and forth, and,

flushing means connected to the gear system and activated

thereby when the pivotal lever is returned to its original position, said means including a flushing line extending





about the periphery of the funnel to provide a flushing spray.

4,549,322

CRADLE ASSEMBLY ADAPTED TO BE RE-ASSEMBLED INTO A BED STEAD FOR ADULTS

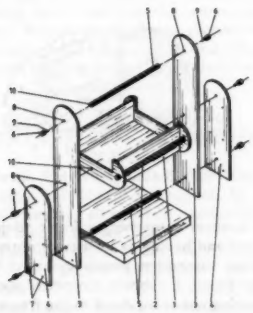
André de Boevé, and Ronny de Boevé, both of Borgesiusstraat 97, 3038 TG Rotterdam, Netherlands

Filed Dec. 15, 1982, Ser. No. 449,868

Claims priority, application Netherlands, Dec. 22, 1981, 8105779

Int. Cl.⁴ A47D *7/00*

U.S. Cl. 5—93 B **1 Claim**



1. A furniture assembly selectively convertible into a cradle, a crib and a bed, said furniture assembly comprising a tray, a base having a length substantially equal to that of said tray, a first pair of first boards, a pair of second boards, each of said second boards having a length approximately half that of said first boards, and a plurality of rods,

said cradle being formed by situating the base on the ground or floor and connecting said first boards at one end to opposite edges of said base to extend upward therefrom, arranging the second boards on the exterior of said first boards, placing said tray between said first boards and connecting said tray to said first and second boards at substantially half the height of said first boards for pivotal movement about a horizontal axis and interconnecting said first and second boards with one or more of said rods,

said crib being formed by situating said first boards standing on a longitudinal edge in horizontal direction, connecting said tray to said first boards at one end thereof and connecting said second boards and base to said first boards at the opposite end thereof, said tray and base extending upwardly from said first boards, and interconnection said first boards by one or more rods,

said bed being formed by situating said first boards standing on a longitudinal edge in a horizontal direction, conecting said second boards to one end of said first boards respectively to extend horizontally therefrom, connecting said tray in said first boards in a vertical direction between the other ends thereof and interconnecting said board by one or more rods.

4,549,323

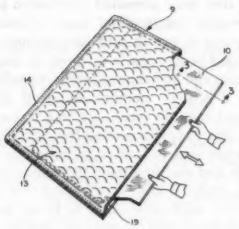
WATERBED MATTRESS PAD

Peter B. Brockhaus, Rte. 1, Owen, Wis.

Filed Aug. 29, 1983, Ser. No. 527,013

Int. Cl.⁴ A47C *27/08;* **B32B** *3/02*

U.S. Cl. 5—455 **4 Claims**



3. An insulated mattress pad comprising:

a. a pocketed covering having substantially coextensive rectangular shaped top and bottom covers fastened together along three edges thereof to form a pocket, the top cover comprising an outer layer moisture resistant air permeable non-woven fabric and an inner layer of fiberous moisture absorbing material attached to the outer layer, the bottom cover being of a moisture resistant air permeable non-woven fabric; and

b. a laminated insulating pad removably inserted in the pocket of the covering, the insulating pad comprising:

i. at least two layers of encapsulated air bubbles, each layer of air bubbles comprising a discrete sheet of clear polyethylene material embossed on one side with a plurality of indentations terminating in crowns and a skin of heat reflective material embossed substantially coextensive with and bonded to each embossed sheet on the open sides of the indentations to encapsulate the air within the indentations, the crowns of the layers of embossed material being bonded together in superimposed and coterminus relationship to thereby create a pair of oppositely facing outer surfaces formed by the skins; and

ii. a pair of abrasion resistant outer sheets of clear polyethylene material substantially coextensive with the layers of encapsulated air bubbles, one outer sheet being

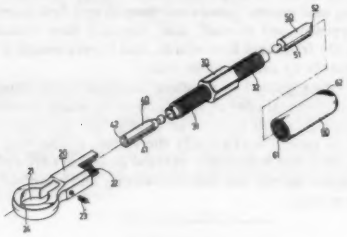
bonded to each skin of the bonded layers of encapsulated air bubbles to prevent abrasion of the encapsulated air bubbles during continuous use by a person sleeping on the mattress pad.

4,549,324

COMBINATION OF SCREW SPANNER AND NUT BREAKER

Mou T. Liou, 33 Hsi Hu Rd., Ta Li Hsiang, Tai Chung Hsien, Taiwan

Filed May 18, 1984, Ser. No. 611,858
Int. Cl.[4] B25F *1/02*
U.S. Cl. 7—142 **3 Claims**



1. A combination screw spanner and nut breaker comprising: a head piece including a nut receiving hole and a female threaded longitudinal hole communicating with said nut receiving hole; a first engaging piece having a first front end and capable of sliding in said longitudinal hole; and a tail piece having a first male threaded protrusion capable of urging said first engaging piece to slide toward said nut receiving hole when said first male threaded protrusion is screwed into said female threaded longitudinal hole, whereby when said first engaging piece is put in said longitudinal hole and said first male threaded protrusion is screwed on said longitudinal hole said first front end and the wall defining said nut receiving hole can clamp a nutlike member and thus said head, said first engaging and said tail pieces act as a screw spanner; a second engaging piece having a second front end having a knife edge; whereby when said second engaging piece is put in said longitudinal hole and said first male threaded protrusion is screwed on said longitudinal hole said second front end and said wall can cooperate with each other to break said nutlike member and thus said head, said second engaging and said tail pieces act as a screw nut ruiner; and a second male threaded protrusion provided on said tail piece and coaxial and opposite with said first male threaded protrusion; and a female threaded cover capable of being screwed on said second male threaded protrusion to reserve one of said first and second engaging piece therein.

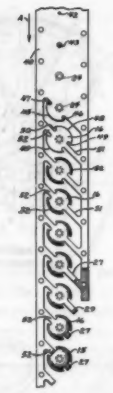
4,549,325

METHOD OF MAKING INTERNAL NUT FOR ADJUSTING THE TENSION OF A COIL SPRING

Peter G. Seyler, Franklin Park, Ill., assignor to Perfection Spring & Stamping Corp., Mt. Prospect, Ill.

Division of Ser. No. 518,199, Jul. 28, 1983,. This application Oct. 9, 1984, Ser. No. 659,086
Int. Cl.[4] B21D *53/24*
U.S. Cl. 10—86 R **5 Claims**

1. A method for forming an externally threaded nut from a flat strip of material comprising the steps of piercing said strip to form an opening therethrough and extruding the material about said opening to produce a tubular cylinder extending normal to the plane of said strip; die-cutting a first cutout in said strip to form a first arcuate edge defining one side of a planar disc, first portions of a pair of notches at opposite ends of said arcuate edge, and first side edges of a pair of connecting portions extending radially from said notches; die-cutting a second cutout to form a second arcuate edge defining a side of said disc opposite from said one side, second portions of said notches, and second side edges of said connecting portions; said connecting portions providing connections between said disc and the remainder of said strip and merging with a central portion of said disc within said notches; coining said disc along said first and second arcuate edges to form radiused upper and lower surfaces therealong; deforming the outer rim portion of



said disc out of the plane of said central portion so that the coined periphery of said disc defines the major extent of one helical screw thread beginning and ending at one of said notches, said screw thread at the other of said notches being interrupted but lying in generally the same plane as said central portion of said disc; and thereafter severing said connecting portions to release said externally-threaded nut from said strip of material.

4,549,326

STREET SWEEPER WITH ELEVATOR CONVEYER ADJUSTABLE IN HEIGHT WITH RESPECT TO THE GROUND

Jean Pineau, Suresnes, France, assignor to Le Materiel de Voirie, Argenteuil, France

Filed Nov. 30, 1984, Ser. No. 676,581
Claims priority, application France, Dec. 5, 1983, 83 19388
Int. Cl.[4] E01G *1/02*
U.S. Cl. 15—84 **5 Claims**

1. A street sweeper comprising a frame adapted for travel over the ground and having at least two transversely spaced wheels, a spring suspension means mounted between each wheel and the frame, a rubbish receptacle mounted on the frame, an elevating conveyor fixed to the frame and having a lower end situated in the region of the two wheels, therebetween, and an upper end situated above the receptacle, and an elongated pick-up rotary brush extending transversally adjacent to the lower end of the elevating conveyor for sweeping the rubbishes on the ground and projecting them into trans-

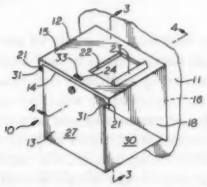
porting elements of the elevating conveyor, an actuating means associated to each spring suspension means and connected on the one hand to the frame and on the other to a spring of the corresponding spring suspension means, and which, in a first position, compresses the spring to its maximum static load and, in a second position, leaves the spring free of strain, said elevating conveyor being fixed to the frame in a position such that, when the actuating means is in its first position, the lower end of the elevating conveyor is at a predetermined level above the ground, which is smaller than the level thereof when said actuating means is in its second position.

4,549,327

CLEANER AND CHALK DUST RECEPTACLE FOR CHALK BOARD ERASERS

Robert M. Johnson, 201 Mark St. SW., Decatur, Ala. 35601

Filed Sep. 21, 1984, Ser. No. 652,734
Int. Cl.[4] B43L *21/00*; A47L *25/00*
U.S. Cl. 15—236 R **10 Claims**



1. A cleaner and chalk dust receptacle for chalk board erasers comprising;

a container member having an open top, a bottom wall, a back wall, a front wall, and a pair opposed side walls, said side walls provided with opposed outwardly projecting container support means extending longitudinally therealong,

a cover member for receiving and supporting said container member having an open front, a top wall having an opening therethrough, a back wall, and a pair of side walls extending from said open front to said back wall, the interior surface of said side walls provided with opposed support receiving means extending longitudinally therealong,

said support receiving means of said side walls of said cover member adapted to slidably receive said support means of said container member, and

scraper means disposed on the top surface of said top wall to extended transversely across said opening of said top wall for scraping chalk dust from the bottom surface of said chalkboard erasers when drawn thereacross, said container to receive said scraped chalk dust into said open top through said opening in said cover member.

4,549,328

CONVERTIBLE VACUUM AND POWDER CARPET CLEANER

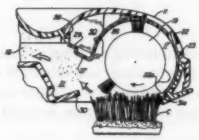
William J. Martin, Watervliet; Keith E. Carr, Lincoln Township, Berrien County, and Edward C. Peterson, St. Joseph Township, Berrien County, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

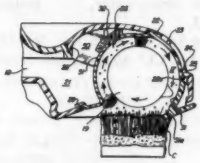
Filed Jul. 13, 1983, Ser. No. 513,332
Int. Cl.[4] A47L *9/00*
U.S. Cl. 15—338 **21 Claims**

1. In a vacuum cleaner apparatus including a nozzle defining a brush space, a wand opening at one end to within said nozzle for moving the nozzle over a floor surface to be cleaned and conducting to a collector dirt picked up from the floor surface by the nozzle as a result of suction applied to said nozzle through said wand, a powered brush rotatably carried by the nozzle in said brush space, and power transmitting means carried by the wand for causing selective operation of the powered brush, improved means for selectively preventing application of suction to the nozzle while concurrently permitting energization of said powered brush by said power transmitting means to effect a powder carpet cleaning operation by the working of powder cleaner against the floor surface by the brush, said suction preventing means comprising:

a shroud;

means movably mounting said shroud within said nozzle to extend partially about said brush for selectively preventing application of suction through said nozzle and preventing clogging of the brush space by powder cleaner picked up by the brush tending to clog said brush space about the brush; and





means for effecting selective disposition of said shroud

(a) in a retracted position permitting suction to be applied to the nozzle at said brush for picking up dirt on said floor surface loosened by the brush, and

(b) in an operative position preventing application of suction to said nozzle through said wand for preventing suction of powder from adjacent said brush into said wand and thereby permitting said brush to be operated as a carpet cleaning means for working powder cleaner against the floor surface for extraction of dirt from the carpet, and permitting subsequent removal of the extracted dirt and cleaning powder to said collector by suction applied through said wand to adjacent said brush upon return of the shroud to said retracted position.

4,549,329

PORTABLE WET AND DRY SELF-CLEANING VACUUM DEVICE

Joseph V. St. Clair, 26 Rockwood Dr., Southington, Conn. 06489

Filed Jul. 11, 1984, Ser. No. 629,611
Int. Cl.[4] A47L *7/00*
U.S. Cl. 15—353 **6 Claims**

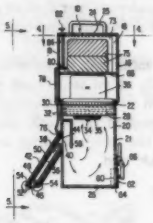
1. A self-cleaning, portable vacuum device for picking up, storing and subsequently discharging dry, liquid, or semi-liquid material comprising:

(a) an elongate tubular housing member having a top closure member covering one end, a bottom closure member covering the other end, and a partition intermediate said ends dividing said housing into an upper chamber and lower chamber,

(b) an air pump and a drive motor therefore mounted in said lower compartment, said air pump having an inlet opening into said lower compartment and an outlet opening venting to the atmosphere,

(c) a tubular suction member extending outwardly from said

housing, such suction member having one end adjacent an opening through said housing into said lower chamber and the outer end adapted to contact said material to be picked up, and



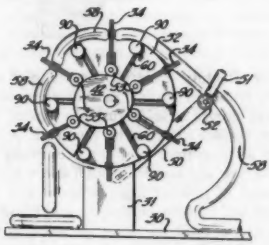
(d) means for introducing a cleaning fluid into said tubular suction member to clean and lubricate same as said material is drawn up said suction member and deposited in said lower chamber by the vacuum created by said air pump.

4,549,330

APPARATUS FOR PREPARING SAUSAGE LINKS

Francis J. Ziolko, Bridgewater, N.J., assignor to Devro, Inc., Somerville, N.J.

Filed Sep. 30, 1983, Ser. No. 537,763
Int. Cl.[4] A22C *11/00, 11/10*
U.S. Cl. 17—34 **7 Claims**



1. In an apparatus for forming sausage links from a stuffed casing, said apparatus including a plurality of pairs of forming arms mounted on a mounting means capable of moving in a continuous cycle, means to direct a stuffed casing into an open pair of forming arms, said forming arms being movable from an open position to a closed position to form a link end, and in which the distance between adjacent forming arms determines the minimum length of the sausage link, the improvement comprising an additional link length adjusting means positioned between adjacent forming arms to change the length of the stuffed casing between said adjacent pairs of forming arms, thereby, changing the length of the formed sausage link.

4,549,331

BUTTON FOR RECEIVING AND SECURING A FABRIC COVERING THEREFOR AND FABRIC-COVERED BUTTON ASSEMBLY FORMED THEREWITH

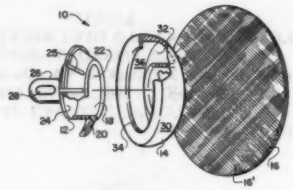
Charles R. Coley, Blowing Rock, N.C., assignor to Plus One Ltd., Blowing Rock, N.C.

Filed Oct. 12, 1983, Ser. No. 541,357
Int. Cl.[4] A44B *1/12, 1/38*
U.S. Cl. 24—92 **14 Claims**

1. A button for receiving and securely holding in place a fabric covering therefor comprising:

a. a base element having a central body portion and resilient fabric-engaging flange means extending outwardly therefrom and annularly thereabout, and

b. a relatively inflexible cap member having an interior surface portion including an annular wall portion and having an annular lip extending inwardly from said annular wall portion defining an interior area dimensioned between said annular wall portion slightly smaller than the corresponding dimensioning across said flange means for receiving said base element in said interior area with said annular wall portion in deforming engagement with said flange means for engaging fabric therebetween and with



said annular lip disposed outwardly of said flange means for retaining said flange means in said interior area,

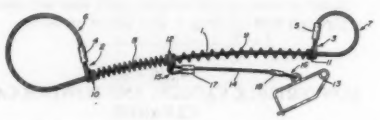
said flange means being resiliently deformable to varying degrees for accommodating selective engagement between said flange means and said annular wall portion of said cap member of fabrics of varying thicknesses and said cap member being adapted for receiving said base element to varying depths inwardly within said interior area in inverse relation with the thickness of fabric engaged between said cap member and said base element.

4,549,332

RESTRAINT FOR FLEXIBLE CONDUITS

Damien Pouliot, 836 - 14th Ave., Pointe-aux-Trembles, Quebec, Canada H1B 3T1

Filed Jan. 16, 1984, Ser. No. 571,197
Int. Cl.[4] A44B *21/00;* **F16L** *35/00*
U.S. Cl. 24—335 **6 Claims**



1. A safety device for use in conjunction with separable conduits carrying a pressurized fluid, comprising: a single flexible strand of material, each end portion of which is folded about itself and forms a non-variable size end loop, said end loops freely slidable in both directions about said strand of material to form opposite variable size main loops for engagement about said flow conduits at a position on both sides of an expected place of separation of said conduits and resilient means acting on said end loops to reduce the opening of said main loops and to allow their installation on various sizes of conduits.

4,549,333
PROCESS FOR PREPARATION OF A ROW OF TWO DIFFERENT AND ALTERNATING TYPES OF DROP WIRES, AND AN ASSEMBLY RESULTING FROM SUCH PROCESS

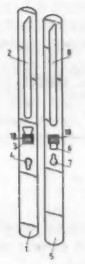
Peter Stähli, Quarten, Switzerland, assignor to E. Fröhlich AG, Mühlehorn, Switzerland

Filed Apr. 23, 1984, Ser. No. 603,171

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1983, 3314615

Int. Cl.⁴ D03J *1/14*

U.S. Cl. 28—205 **6 Claims**



1. A process for preparation of a row of two different and alternating types of drop wires for the automatic drawing-in of a warp for a weaving machine, wherein said drop wire types each have a thread eye spaced the same distance from one end thereof, each have an identical elongated slot spaced the same distance from the other end thereof for the reception of a rack rail or a contact rail of a warp stop motion device on which the drop wires are adapted to hang, and each have a keyhole spaced from said thread eye in one of said types of drop wires a different distance than the spacing of a keyhole from said thread eye in the other of said types of drop wires, and wherein an elongated lease rod is employed for displacement of a first of said two types of drop wires along their longitudinal axes until said keyholes of all said drop wires are aligned between said drop wires to facilitate the reception of a pin for the pinning of said drop wires, comprising the steps of providing said thread eyes of said one and said other of said types respectively with relatively spaced apart rod engaging means, providing said lease rod with first and second transversely spaced apart surface means at one end segment thereof for respectively engaging said engaging means, said first and second surface means being coincident at an opposite end segment of said lease rod, and passing said lease rod through said thread eyes with said surface means in engagement with said engaging means for effecting said displacement of said first type of drop wires.

4,549,334
FABRIC MOUNTING TRACK SYSTEM

Lloyd Miller, 16842 Greenview La., Huntington Beach, Calif. 92649

Filed Nov. 16, 1982, Ser. No. 441,990

Int. Cl.⁴ B25B *27/14*

U.S. Cl. 29—278 **12 Claims**

1. In combination with a fabric mounting track for mounting a fabric on a wall of the t:ype including:

(a) a hinge lock plate;

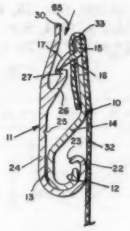
(b) a back support plate;

(c) said plates having means on one end for pivoting them through 180°;

(d) said hinge lock plate having a row of large and small lancings;

(e) said back support plate having ledge means protruding therefrom so that said small lancings impact said ledge means while said large lancings hook behind said ledge means when said plates face each other, thereby to lock said plates; and

(f) an unlocking tool for unlocking said locked and facing plates, said unlocking tool consisting of an elongated handle and an enlarged front portion having a small protrusion extending at substantially 90° from said front portion along the front end thereof, said tool being of unitary construction, whereby said tool is capable of being inserted into the ends between said plates and rotated with respect to the planes of said plates to pry said plates apart, while said handle is being bent to avoid hitting the ceiling of the room to be covered with fabric.



4,549,335
METHOD OF MANUFACTURING MULTICONDUCTOR CABLES

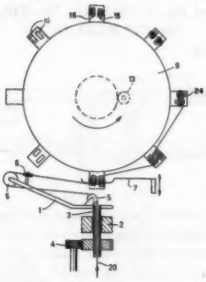
Joannes J. H. M. Gorris, Eindhoven, and Wilhelmus L. L. Lenders, Son, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 17, 1983, Ser. No. 505,537

Claims priority, application Netherlands, Jul. 7, 1982, 8202728

Int. Cl.⁴ H01R *43/04*

U.S. Cl. 29—866 **4 Claims**



1. A method of manufacturing a cable comprising a number of insulated wires extending between two connector blocks to which each wire is connected at its ends, characterized by

providing two spaced points of support, said points being adjustable to vary the distance between them,

providing two connector blocks on one of said points of support, each comprising a number of connectors corresponding to said number of wire turns,

winding a wire several times around said two spaced points of support, such that the resulting turns of wire are disposed at equal distances from one another on the points of support,

then, at said one of the points of support, connecting each of the wire turns to the respective connectors of said two connector blocks, and

then severing the turns at said one of the points of support between the two connector blocks.

4,549,336

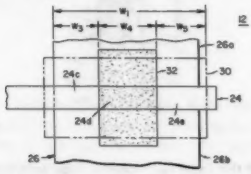
METHOD OF MAKING MOS READ ONLY MEMORY BY SPECIFIED DOUBLE IMPLANTATION

Sheppard Douglas P., Grapevine, Tex., assignor to Mostek Corporation, Carrollton, Tex.

Division of Ser. No. 334,900, Dec. 28, 1981, abandoned. This application May 9, 1984, Ser. No. 608,539

Int. Cl.⁴ H01L *29/78, 21/263*

U.S. Cl. 29—576 B **3 Claims**



1. A method of fabricating an MOS read only memory to a customer's specifications, comprising the steps of:

applying a first type implant to the channels of certain trasistors of the read only memory which have been selected in accordance with the customer's specification, and

applying a second type implant to a selected portion of said channels in accordance with the customer's specification to reduce the effective size thereof, thereby reducing the source-drain current and corresponding power consumption of said transistors.

4,549,337

METHOD OF MAKING A COMPOSITE THREAD PROTECTOR

S. David Newell; William F. Matko, both of DuBois; James L. Onoratti, Brockway, and Lawrence H. Parrott, DuBois, all of Pa., assignors to Alco Industries, Inc., Valley Forge, Pa.

Filed Jul. 1, 1983, Ser. No. 510,199

Int. Cl.⁴ B22D *11/126*

U.S. Cl. 29—527.4 **10 Claims**

1. A method of making a composite elastomer to metal shell dual wall thread protector for a threaded end of a pipe member that is practical for use and reuse under elevated, normal and frigid temperature conditions which comprises, deepdraw forming a metal blank into an elongated cylindrical shell having a continuous substantially closed end wall and an opposite substantially open end wall, forming a casting assembly by placing the metal shell and its closed end wall in a cooperating mold cavity defining relation with respect to a hollow die having an opposed threaded side wall therealong, introducing a normally thermoplastic synthetic elastomer material in heat-liquidized form into and filling the mold cavity along the threaded wall of the die, solidifying by preliminarily heat-curing the elastomer material within the mold cavity as an adherent wall casting along the metal shell wall and forming a solidified elastomer to metal shell adherent dual wall assembly therewithin, then removing the hollow die by unscrewing the thus-formed elastomer to metal shell adherent dual wall assembly with respect to the die, thereafter subjecting the elastomer wall of the dual wall assembly to a final heat-curing treatment, and effecting the heat-curing in such a manner as to make the solidified elastomer wall fully thermosetting and to also improve its resistance to chemicals such as encountered in the oil fields.

4,549,338

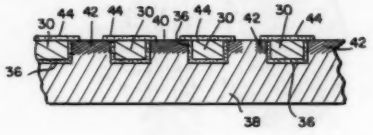
METHOD OF FABRICATING AN IC INCLUDING ELECTRO-OPTICAL TRANSMITTERS AND RECEIVERS

Robert J. Abend, Palm Bay, and C. Byron Shelton, Jr., Sattelite Beach, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Nov. 18, 1983, Ser. No. 553,114

Int. Cl.⁴ H01L *21/20, 21/302, 21/76, 31/12*

U.S. Cl. 29—569 L **7 Claims**



1. A method of fabricating an integrated circuit comprising:

forming trenches in a first surface of a wafer of electro-optical transmitting material;

covering said first surface and trenches with a containment layer to prevent diffusion of impurities from said electro-optical transmitting material during subsequent steps;

overfilling said trenches with polycrystalline silicon material;

removing material from a second surface of said wafer opposite said first surface to a level exposing said polycrystalline silicon in said trenches;

converting exposed portions of said polycrystalline silicon to single crystal silicon; and

forming active devices in exposed portions of said electro-optical transmitting material and single crystal silicon.

4,549,339

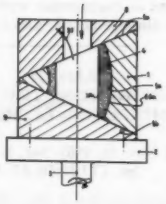
APPARATUS AND METHOD FOR MANUFACTURE OF CURVED HOLLOW TOROIDAL ELEMENTS

Pierre Lajoye, 40 Rue de la Vacquiniere, Montigny les Metz (Moselle), France

Filed Mar. 28, 1983, Ser. No. 479,308

Int. Cl.⁴ B22D *13/00, 11/126, 13/06*

U.S. Cl. 29—527.6 **20 Claims**



1. A method of manufacturing a hollow curved member comprising the consecutive steps of:

admitting a predetermined amount of fluid material into a mold having a cavity therein in the shape of a portion of a toroid having a curved longitudinal axis and a mean longitudinal axis tangential to said curved longitudinal axis at the midpoint thereof;

rotating said mold generally about an axis displaced a predetermined distance from said mean longitudinal axis such that said predetermined amount of fluid material becomes

distributed in said cavity in the form of a hollow toroid of fluid material solidifying said fluid material in said rotating mold such as to form a blank having the shape of a hollow toroid having a toroidal outer surface, a cylindrical inner surface, and two opposing open ends;

removing said blank from said mold; and

removing material from the inner surface of said blank such as to produce a toroidal inner surface therein.

4,549,340

METHOD OF MAKING CMOS SEMICONDUCTOR DEVICE USING SPECIALLY POSITIONED, RETAINED MASKS, AND PRODUCT FORMED THEREBY

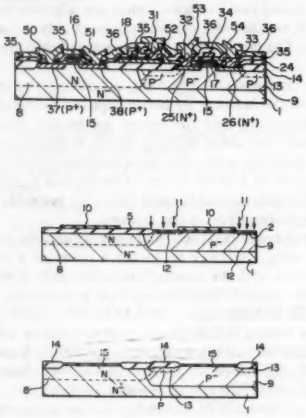
Kouichi Nagasawa, Kunitachi; Shuji Ikeda, Koganei; Norio Suzuki, Kodaira, and Yoshio Sakai, Hachiouji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 8, 1983, Ser. No. 530,471

Claims priority, application Japan, Sep. 24, 1982, 57-164832

Int. Cl.⁴ H01L *21/265, 21/22, 29/78*

U.S. Cl. 29—571 **48 Claims**



1. A method of manufacturing a semiconductor device at least in part in a semiconductor body, said semiconductor body including in its major surface a first semiconductor region of a first conductivity type and a second semiconductor region of a second conductivity type, said major surface being divided into a plurality of regions by an isolation area which isolates the plurality of regions, comprising the steps of:

(b) covering said first semiconductor region with a first mask which has different etching characteristics than that of said isolation area;

(c) introducing an impurity of the first conductivity type selectively into said second semiconductor region by the use of said first mask;

(d) covering said second semiconductor region with a second mask which has different etching characteristics than that of said first mask, said second mask being formed at least in part by depositing a material which forms said second mask;

(e) removing said first mask except parts covered with said second mask, by etching;

(f) introducing an impurity of the second conductivity type selectively into said first semiconductor region by the use of said second mask; and

(k) forming a first conductor layer selectively on said second mask after performing said step (f).

4,549,341

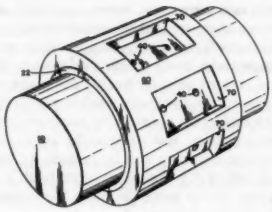
METHOD FOR PRODUCING A PERMANENT MAGNET ROTOR

George Kasabian, Los Angeles, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Jul. 19, 1983, Ser. No. 515,331

Int. Cl.⁴ H02K *15/02*

U.S. Cl. 29—598 **17 Claims**



1. A method of manufacturing a rotor, comprising:

providing a shaft of magnetizable material;

casting a layer of non-magnetizable material around said shaft, said layer being cast to leave a plurality of apertures circumferentially located therein about said shaft, said apertures extending radially inward through said layer to the surface of said shaft;

mounting a plurality of rare earth permanent magnets into said apertures; and

installing a sleeve of non-magnetizable material over said permanent magnets and the portion of said layer adjacent thereto.

4,549,342

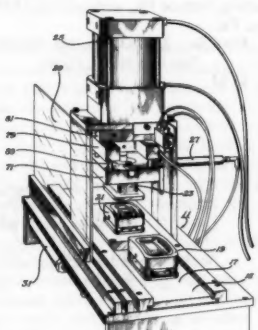
BELT BUCKLE MACHINE

Bob Vanover, Sr., 5000 Redwood Dr. North, Ft. Worth, Tex. 76119

Filed Jun. 22, 1984, Ser. No. 623,844

Int. Cl.⁴ B21D *53/46*

U.S. Cl. 29—3 **3 Claims**



1. An improved machine for forming a belt buckle which has outer and inner buckle pieces that cooperatively hold a pliable and decorative covering over the outer piece, the machine comprising in combination:

a frame;

a table mounted on the frame for powered reciprocating horizontal movement;

a pair of laterally spaced lower dies on the reciprocating table, one being the outer buckle piece die and the other being the inner buckle piece die, each die having a core piece and forming frame to selectively engage the buckle pieces and decorative covering to form a buckle;

an upper die mounted on the frame for powered reciprocating vertical movement selectively against both the inner buckle piece die and the outer buckle piece die;

the upper die having an outer frame which contains therein a core and a pressure frame located in an annular cavity between the core and the outer frame;

the pressure frame being reciprocable between an upper position and a lower position relative to the core and outer frame, so that an outer buckle piece and protective covering placed on the outer buckle piece die will enter the cavity and press against the pressure frame when in the upper position, and so that the outer buckle piece and protective covering will be pressed by the pressure frame out of the cavity against an inner buckle piece located on the inner buckle piece die when the pressure frame moves to the lower position;

the core being movable between a lower position relative to the outer frame which occurs while the pressure frame is moving to the upper position and an upper position which occurs while the pressure frame is moving to the lower position;

a mandrel movable between upper and lower positions and adapted to engage the pressure frame for moving the pressure frame to the lower position, the mandrel having a transverse hole;

an adapter member located above the core and through which reciprocally extends the mandrel, the adapter member having a transverse hole;

for reciprocable pin means mounted to the outer frame of the upper die for movement between an inner position located in the holes to lock the core in the lower position and the mandrel in the upper position, and an outer position retracted from the holes to allow movement of the core and mandrel relative to each other and to the outer frame; and

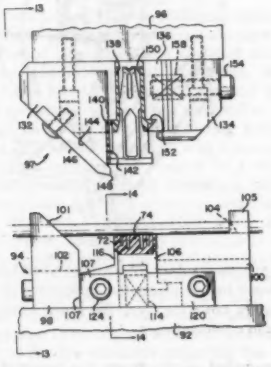
means for moving the mandrel between the upper and lower positions.

4,549,343

APPLICATOR FOR INSTALLING TWO PART CONNECTOR ASSEMBLIES IN CABLES

Daniel B. Grubb, Hummelstown, and Donald W. K. Hughes, Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 2, 1983, Ser. No. 529,054
Int. Cl.[4] H01R *43/04*
U.S. Cl. 29—33 M **8 Claims**



1. Apparatus for cutting a cable and installing a connector assembly on the cut end of the cable, the cable comprising a plurality of conductors in side-by-side parallel relationship in a single plane, the connector assembly comprising a connector housing and a cover, the housing having a conductor-receiving face, oppositely facing housing sidewalls and oppositely facing housing endwalls, the sidewalls and endwalls surrounding, and extending from, the conductor-receiving face, the housing having a row of cavities extending inwardly from the conductor-receiving face, the cavities being side-by-side in the row which is between the endwalls, a terminal in each of the cavities, the terminals having conductor-receiving slots at the conductor receiving face, the slots extending normally of the conductor-receiving face and being recessed from the conductor-receiving face so that conductors which extend parallel to the conductor-receiving face can be moved laterally of their axes and into the conductor-receiving slots, one sidewall of the housing having wire-admitting slots therein through which wires inserted into the conductor-receiving slots extend, the cover being dimensioned for assembly to the conductor-receiving face and having inserters thereon for moving conductors into the conductor-receiving slots upon assembly to the housing, the cover having oppositely facing side surfaces and oppositely facing end surfaces which are adjacent to the housing sidewalls and housing endwalls respectively when the cover is assembled to the housing, the apparatus being characterized in that:

the apparatus comprises a cover jig, a housing jig, and a cable locator, the housing jig being opposed to the cover jig, the housing jig and the cover jig having housing holding means and cover holding means respectively for holding a housing with the conductor-receiving face thereof opposed to a cover in the cover jig, the jigs being relatively movable towards each other to assemble the cover to the mating face of the housing,

the cable locator being between the cover jig and the housing jig and being effective to locate a cable in a plane between the jigs with the conductors in the cable in alignment with the conductor-receiving slots in terminals in a housing in the housing jig,

the housing jig having a first shearing edge thereon which extends parallel to, and is beside one sidewall of a housing in the housing jig, the cover jig having a second shearing edge thereon which extends beside, and is adjacent to, one side surface of a cover in the cover jig, the one side surface being in alignment with the one sidewall of the housing in the housing jig,

the first and second shearing edges being discontinuous, each shearing edge comprising a plurality of spaced-apart shearing edge segments which are in alignment with discrete wires in the cable locator whereby,

upon placement of a connector housing and cover in the housing jig and cover jig, location of a cable by the cable locator, and upon relative movement of the cover jig towards the housing jig, the cable will be severed by the shearing edges and the conductors will be inserted into the conductor-receiving slots of the terminals.

4,549,344

METHOD OF DRIVING FASTENERS WITH A BUMPERLESS PNEUMATIC GUN

Milovan Nikolich, Skokie, Ill., assignor to Signode Corporation, Glenview, Ill.

Division of Ser. No. 208,215, Nov. 19, 1980, Pat. No. 4,401,251. This application May 31, 1983, Ser. No. 499,370
Int. Cl.[4] B23P *11/00*
U.S. Cl. 29—432 **10 Claims**

1. A method of reciprocably moving a pneumatically operated piston for driving fasteners into a workpiece, said piston being slidably mounted within a cylinder, which comprises the steps of:

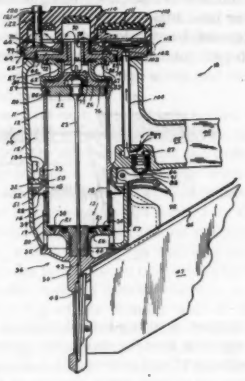
(a) supplying air under pressure to a chamber above the piston;

(b) controlling the flow of high pressure air from said cham-

ber into the cylinder to force the piston through a driving stroke thereby forcing a fastener into a workpiece;

(c) storing air admitted into the cylinder above the piston used to drive the piston through its driving stroke;

(d) compressing the air within the cylinder below the piston to form a cushion thereby preventing said piston from



striking an end of the cylinder to reduce the impact forces generated by the piston;

(e) venting off the air above the piston to the atmosphere; and

(f) returning the air stored during the driving stroke of said piston into the cylinder beneath the piston to force said piston to a position for driving another fastener.

4,549,345

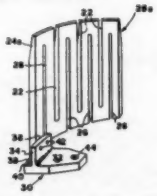
METHOD OF MAKING A GRAPHITE ZIG-ZAG PICKET HEATER

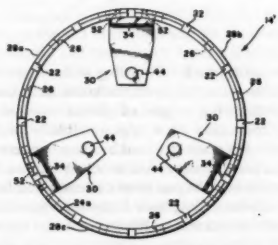
Harvey J. Wilsey, 2602 Bennett St., Sherman, Tex. 75090

Division of Ser. No. 323,122, Nov. 19, 1981, Pat. No. 4,410,796. This application Aug. 12, 1983, Ser. No. 522,727

Int. Cl.[4] H05B *3/00*

U.S. Cl. 29—611 **2 Claims**





1. The method of making a zig-zag picket-type graphite heater element having an upper end and a lower end, comprising the steps of: forming a hollow cylindrical, graphite shell with axially extending slots through the wall of said shell, at uniformly circumferentially spaced locations, alternately from opposite ends of said shell to a length less than the length of the shell to form zig-zag pickets around the circumference of the shell; extending a plurality of said slots, at uniformly spaced locations about the circumference, the entire length of the shell to an end thereof, to divide the shell into a plurality of like arcuate, discrete, zig-zag picket segments; assembling said segments in cylindrical form by rigidly mechanically connecting them with discrete graphite connector elements having base portions with projecting flange portions, which abut and secure pairs of adjacent segments together in a spaced apart relation wherein their circumferential spacing is substantially the circumferential width of the slots so as to form a rigid cylindrical shell having uniform electric current flow characteristics, the connector elements bridging the spacing between adjacent segments at the lower end of the heater element; and electrically connecting said base portions of the discrete graphite connector elements to permit the application of an electrical current to said pickets via said connector elements.

4,549,346

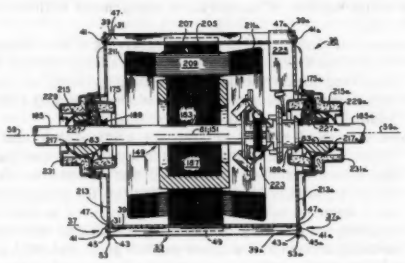
APPARATUS FOR ASSEMBLING A DYNAMOELECTRIC MACHINE

Robert W. White, DeKalb, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Jun. 21, 1983, Ser. No. 506,344

Int. Cl.[4] H02K *15/14*

U.S. Cl. 29—736 **13 Claims**



1. Apparatus for assembling a stator for a dynamoelectric machine with an end frame therefor, the stator including a bore having a central axis, a set of beams secured to the stator and having at least one abutment portion with a tab extending therefrom, respectively, and the end frame including a pair of opposite faces with a set of apertures intersecting therebetween, respectively, and an alignable bearing means associated with one of the opposite faces of the end frame for defining a central axis thereof, the apparatus comprising:

a base having an opening therethrough;

a supporting member mounted to said base and including a bore, and means for seating the stator;

an expandable arbor mounted to said base and having a predetermined reference axis, said expandable arbor extending through said supporting member bore and the stator bore when the stator is seated on said seating means of said supporting member;

means operable generally for actuating said expandable arbor into locating engagement with the stator bore so as to align the central axis thereof with the predetermined reference axis of said expandable arbor;

extension means mounted to said expandable arbor and arranged generally coaxially with the predetermined reference axis for receiving in locating engagement the alignable bearing means of the end frame so as to align the

central axis thereof with the predetermined reference axis and stator bore axis at least when one of the opposite face thereof is seated against the at least one abutment portions of the beams with the tabs thereof extending through the apertures in the end frame beyond the other of the opposite faces thereof, respectively; and

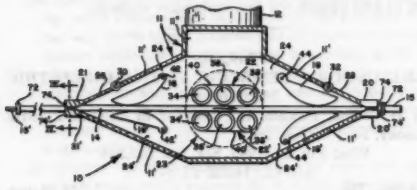
means for securing the tabs to the one end frame when the central axii of the stator bore and the end frame are aligned with the predetermined reference axis.

4,549,347

CONTACT INSERTION AND WIRE LAY ROBOTIC END EFFECTOR APPARATUS

Constantine M. Travlos, 7924 Springway Rd., Baltimore, Md. 21204; James A. Henderson, P.O. Box 366, Finksburg, Md. 21048, and Mark Weixel, 4671 Beechwood Rd., Ellicott City, Md. 21043

Filed May 16, 1984, Ser. No. 610,913
Int. Cl.[4] B23P *19/00*
U.S. Cl. 29—749 **2 Claims**



1. A contact insertion and wire lay apparatus, comprising:

a collar capable of cooperative engagement with a robot arm;

means coupled to said collar for receiving a wire segment which has a first and second contact affixed thereto, said receiving means including a housing defining an upper and a lower housing section, said sections defining a longitudinal wire-access slot therebetween;

means coupled to said housing for manipulating said received wire segment into a desired layout, said manipulating means including a drive belt and at least one drive roller; a plurality of auxiliary wire grips for gripping said wire segment, said auxiliary wire grips being in the form of an upper pair of grips pivotally coupled to said upper housing section and a lower pair of grips pivotally coupled to said lower housing section, a first one of said upper and of said lower pair of grips capable of cooperating to grip said wire segment therebetween and a second one of said upper and of said lower pair of grips capable of cooperating to grip said wire segment therebetween; and means for rotating said receiving means; and

first means coupled to said housing for inserting said first contact of said wire segment into a first connector, and second means coupled to said housing for inserting said second contact of said wire segment into a second connector, wherein each of said inserting means includes a pair of tip jaws defining a wire-segment recess therebetween.

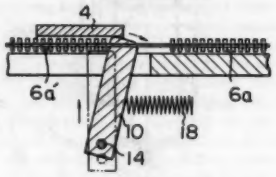
4,549,348

APPARATUS FOR SECURING BOTTOM END STOP TO FASTENER CHAIN

Yoshiyuki Toishi, Toyama, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Division of Ser. No. 449,514, Dec. 13, 1982, Pat. No. 4,494,292. This application Oct. 5, 1984, Ser. No. 658,160
Claims priority, application Japan, Dec. 29, 1981, 56-214770
Int. Cl.[4] A41H *37/06*
U.S. Cl. 29—767 **8 Claims**

1. An apparatus for securing a bottom end stop to an indefinite length of fastener chain including alternating engaged fastener element portions and space portions where fastener elements are removed comprising means for feeding said indefinite length of fastener chain in a longitudinal direction on a machine base, a chain stopper for protruding from a position below said machine base into each space portion downstream of one of said fastener element portions as the fastener chain is being fed to arrest the movement of the fastener chain as said engaged fastener element portion upstream of said space portion abuts said chain stopper, a chain guide means mounted on said machine base adjacent said chain stopper slidably engaging the opposed lateral side edges of the engaged fastener elements to prevent fastener element separation upstream of



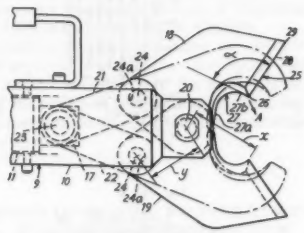
said chain stopper, a spring-loaded element stopper disposed above said machine base for resiliently pressing down on said chain downstream of said space portion, means for pulling said chain stopper out of said space portion to thereby allow the fastener chain to move in said longitudinal direction until said engaged fastener element portion upstream of said space portion abuts against a stop wall of said element stopper, and means for securing a bottom end stop to the end of said engaged element portion upstream of the space portion adjacent said stop wall while said fastener chain is prevent from moving.

4,549,349

CUTTING APPARATUS

Stuart M. Harrison, 223 London Rd., East Grinstead, Sussex, England

Continuation of Ser. No. 430,019, Sep. 30, 1982,. This application Nov. 14, 1984, Ser. No. 671,435
Claims priority, application United Kingdom, Oct. 7, 1981, 8130277
Int. Cl.[4] B23D *21/06;* **B26B** *13/06, 17/00*
U.S. Cl. 30—92 **7 Claims**



4. In a cutting tool, for cutting hollow tubular members of predetermined annular wall thickness and predetermined diameter, comprising a pair of planar opposed blade bodies, pivotally connected at a common blade pivot for relative movement with respect to each other between an open position and a closed position and receivable of an object to be cut therebetween in said open position, each said blade body comprising a substantially planar body having an outer extremity remote from said common blade pivot, the improvement comprising:

tube shearing means, on each of said blade bodies, for shear-

ing the annular wall of the tubular member, said tube shearing means comprising a first cutting edge and a second cutting edge disposed to intersect and form an angle therebetween, said first cutting edge extending from proximate said common blade pivot to said intersection and comprising a circular portion nearest said intersection which merges tangentially with a straight portion proximate said common blade pivot, said second cutting edge extending from said intersection to said outer extremity in a straight line, each of said circular portions having a center of curvature which is closer than the other center of curvature to its respective edge when said blade bodies are in said open position;

tube piercing means, on each of said blade bodies, for simultaneously piercing the annular wall of the tubular member at two diametrically opposed points, said tube piercing means movable into piercing engagement with said tubular member at said diametrically opposed points, said tube piercing means comprising a point formed by the apex of the angle between said first and second cutting edges;

said tube shearing means cooperating with said tube piercing means to shear the tube wall on opposite sides of each of said diametrically opposed points, whereby in operation after initial piercing of the annular wall of the tubular member, and on continued cutting, the incisions made by the tube piercing means each increase away from the initial pierced point toward the sides of the tubular member;

actuating means for pivotally moving said blade bodies relative to one another about said common blade pivot;

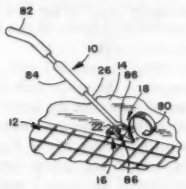
said pair of opposed blade bodies disposed in at least partially overlying relationship proximate said common blade pivot, whereby in said open position, said outer extremities are spaced apart from one another, and, in said closed position, said outer extremities overlap one another, and, as said blade bodies move toward one another, said tube piercing means come into overlapping relation before said outer extremities.

4,549,350

METHOD AND TOOL FOR REMOVING FLOOR COVERING

Glenn Patillo, 3765 Gondar Ave., Long Beach, Calif. 90808

Filed Jan. 18, 1984, Ser. No. 571,734
Int. Cl.[4] B26B *3/00*
U.S. Cl. 30—170 **7 Claims**



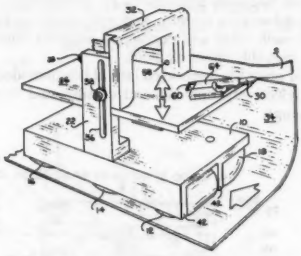
1. A tool for removing a floor covering bonded to a floor comprising a wedge-shaped body defining an inclined planar surface rising upwardly and rearwardly from a leading end of said body at an angle of between 12 degrees and about 18 degrees, a channel-shaped blade mounted in contact with said inclined planar surface at said leading end of said body and having a base from which upright walls rise, and the inner surface of at least one end of said base and the walls of said base at said same end are sharpened, a roller mounted at a rear end of said body remote from said leading end to roll upon said floor and to hold said blade at a fixed angle relative to said floor, an elongated handle rotatably connected to said body beneath said blade, and means for adjustably altering the elevation of said blade from said floor.

4,549,351

COVING CUTTER ASSEMBLY

Dan P. Stanbery, 428 Maple Ave., and Juan A. Valero, 365 Bixby Dr., both of Milpitas, Calif. 95035

Filed Aug. 27, 1982, Ser. No. 412,256
Int. Cl.[4] B26B *29/00*
U.S. Cl. 30—293 **4 Claims**



1. A coving cutter assembly for cutting a flexible covering material to form a cove over the juncture of a substantially horizontal floor surface and a substantially vertical wall surface, said coving cutter comprising:

(a) base means having an upper surface, and an underside adapted for contact with said floor surface, said base means being provided with a plurality of floor engaging support wheels including an elongated, cylindrical support wheel capable of rotating around a horizontal axis;

(b) guide post means rising substantially vertically from said upper surface of said base means, said guide post means including a separated pair of guide posts attached to said upper surface;

(c) a cutter plate adjustably coupled to said guide post means such that the vertical separation between said cutter plate and said upper surface of said base means can be varied and set, and adjustable slide couplings engaged with said pair of posts and supporting said cutter plate;

(d) blade means attached to said cutter plate and adapted to cut said covering material against said wall surface when moved in a horizontal direction along said wall surface; and

(e) cove forming means coupled to said base means and adapted to press said covering material into said juncture, where said cove forming means includes a separated pair of half-spherical wheels, and wherein said plurality of support wheels includes an elongated, cylindrical support wheel extending between said half-spherical wheels, and a pair of shorter, cylindrical support wheels located on either side of said elongated support wheel.

4,549,352

WASHABLE ELECTRIC SHAVER

Masahiko Ochiai, and Yoshinori Taito, both of Nogata, Japan, assignors to Kyushu Hitachi Maxell, Ltd., Fukuoka, Japan

Filed Sep. 14, 1983, Ser. No. 532,220
Claims priority, application Japan, Nov. 10, 1982, 57-170689[U]; Nov. 12, 1982, 57-171831[U]; Nov. 12, 1982, 57-171832[U]; Nov. 12, 1982, 57-171837[U]
Int. Cl.[4] B26B *19/44*
U.S. Cl. 30—41.5 **4 Claims**

1. A washable electric shaver comprising, in combination:

a generally elongated water-tight housing serving concurrently as a grip;

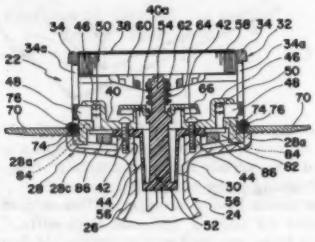
a drive unit housed within said housing;

an operating element mounted on said housing for controlling a power supply control switch for interrupting and initiating supply of electric power to said drive unit;

a generally T-shaped shaving head including a hollow stem mounted at one end on said housing so as to render said

shaver as a whole to represent a generally T-shaped configuration integral with a transverse bench portion a cap mounted removably on said portion, said cap having a pair of spaced end openings defined therein and located substantially on respective sides of said housing, a stationary shear plate replaceably carried by said cap, a generally elongated shear element for movement in engagement with said stationary shear plate to cut hairs to be shaved, and means for supporting said movable shear element within said stem portion and for transmitting a drive from said drive unit thereto, said end openings being aligned with each other and positioned adjacent opposite ends of said movable shear element;

a pair of pivotally supported lateral lids provided on said cap for selectively opening and closing said respective end openings;



means for biasing said lateral lids to open and close said associated end openings;

a slide element supported on said stem portion movable between open and closed positions, said slide element when moved from said close position to said open position bringing said lateral lids in position to open said end openings;

means for transmitting the movement of said slide element to said lateral lids; and

an eccentric drive pin coupled with said drive unit for driving connection with said means for supporting said movable shear element and said transmitting means when said shaving head is mounted on said one end of said housing, said slide element being positioned on said shaver head circumferentially opposite to said operating element on said housing.

4,549,353

DISPLACEMENT MEASURING INSTRUMENT

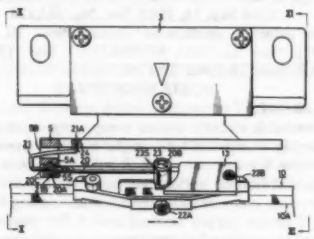
Ichikawa Souji, Kanagawa, Japan, assignor to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Jul. 25, 1983, Ser. No. 516,801

Claims priority, application Japan, Jul. 28, 1982, 57-131529; Jul. 28, 1982, 57-131530

Int. Cl.⁴ G01B *11/04*

U.S. Cl. 33—125 R **29 Claims**



1. A displacement measuring instrument comprising a main scale secured to a first member, and an index scale secured to a second member and reciprocatingly movable together with said second member along the main scale whereby a relative movement between the first and the second members is measured from a relative movement between the main scale and the index scale, wherein there are provided a highly rigid member rotatably engaged at one end thereof with the second member and at the other end thereof with the index scale whereby the second member and the index scale are connected to each other, and a biasing means loaded between the second member and the highly rigid member for urging the index scale against the main scale.

4,549,354

MEASURING SYSTEM

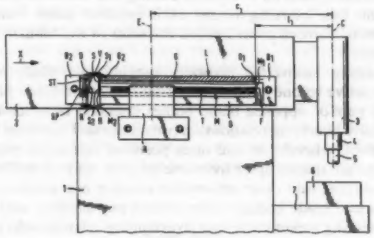
Alfred Affa, Stein, and Alfons Ernst, Traunreut, both of Fed. Rep. of Germany, assignors to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Apr. 24, 1984, Ser. No. 603,496

Claims priority, application Fed. Rep. of Germany, May 3, 1983, 3316081

Int. Cl.⁴ G01B *11/04*

U.S. Cl. 33—125 T **10 Claims**



1. In a measuring device of the type comprising a measuring scale connected to a first object, a scanning unit connected to a second object and positioned to scan the scale to determine the position of the second object with respect to the first object, the improvement comprising:

at least one expansion element defining first and second ends;

means for rigidly fastening the first end of the at least one expansion element to the first object;

means for mounting the scale on the first object such that the scale is shiftable with respect to the first object along a measuring direction; and

means for connecting the second end of the at least one expansion element to the scale such that the at least one expansion element translates the scale with respect to the first object along the measuring direction to compensate for thermal length changes of the first object, said connecting means comprising means for varying the ratio between translation of the second end of the at least one expansion element and translation of the scale caused by the at least one expansion element.

4,549,355

ELECTRONIC DENDROMETER

Ronald H. Sauer, deceased, late of Richland, Wash. (by Joan K. Sauer, legal representative), and Peter A. Beedlow, Kennewick, Wash., assignors to Battelle Memorial Institute, Richland, Wash.

Filed Jan. 4, 1984, Ser. No. 568,251

Int. Cl.⁴ G01B *5/00*

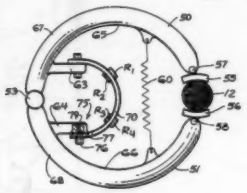
U.S. Cl. 33—148 H **27 Claims**

1. An electronic dendrometer for measuring the diametrical size of herbaceous plant stems, comprising:

a transducer member;

elongated jaws connected to opposite ends of the transducer member for contacting opposite sides of a plant stem;

two arms pivotably connected together with the transducer member spanning between the two arms; the two arms serving to connect the elongated jaws to opposite ends of the transducer member; and



strain gauge means connected to the transducer member for detecting changes in the strain existing in the transducer member, from which changes in the size of the plant stem can be determined.

4,549,356

SEALING ARRANGEMENT FOR MULTICOORDINATE SENSING HEAD

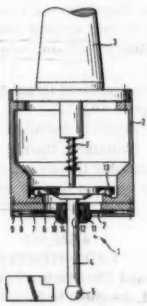
Alfons Ernst, Traunreut, Fed. Rep. of Germany, assignor to Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Continuation of Ser. No. 522,403, Aug. 11, 1983, abandoned. This application Jan. 11, 1985, Ser. No. 690,830

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1982, 3231159

Int. Cl.[4] G01B *7/28*

U.S. Cl. 33—169 R **5 Claims**



1. In a multicoordinate sensing head comprising a housing which defines an opening, a sensing pin which defines an axial direction and includes a free end which extends out of the opening, and means for tiltably mounting the sensing pin to the housing, an improved sealing arrangement comprising:

a plate mounted to the housing such that the plate is movable with respect to the housing in a low friction manner in radial directions transverse to the axial direction and the plate is separated from the mounting means along the axial direction;

a ball slideably mounted to the pin such that the pin is movable with respect to the ball in a low friction manner along the axial direction; and

means for mounting the ball to the plate such that the ball is free to pivot in the plate;

said pin, plate, ball, and mounting means cooperating to cover the opening to substantially prevent contaminants from entering the housing while accommodating low friction movement of the pin with respect to the housing, said movement comprising both axial sliding of the sensing pin with respect to the ball and the plate and angular pivoting of the sensing pin and the ball with respect to the mounting means and the plate.

4,549,357

GOLF CLUB ADJUSTER

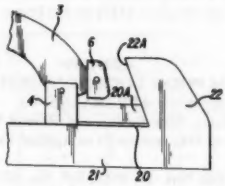
Akio Hirose, 3-31-7 Sanda-cho, Hachioji-City, Tokyo, Japan

Filed Jan. 20, 1984, Ser. No. 572,557

Claims priority, application Japan, Jun. 3, 1983, 58-097966

Int. Cl.[4] G01B *5/24*

U.S. Cl. 33—508 **6 Claims**



1. In a golf club adjusting apparatus having a club head sole contacting surface and a club head face contacting surface the improvement wherein said club head sole contacting surface is generally planar and inclined at an angle between 20° and 40° relative to the horizontal and said club head face contacting surface is generally planar and inclined at an angle of between 5° and 30° relative to the vertical.

4,549,358

APPARATUS FOR AUTOMATIC MEASUREMENT AND CLASSIFICATION OF CARCASES

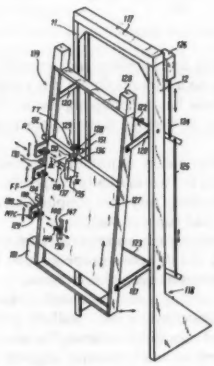
Jean Augé, 1, rue Francois Sarre, 87350 Panazol, France; Jacques Lavaur, Gagnac-sur-Cere, and Michel Assens, Montpellier, both of France, assignors to Jean Augé, Panazol, France

Filed May 25, 1984, Ser. No. 614,242

Claims priority, application France, May 27, 1983, 83 08799

Int. Cl.[4] G01B *7/28*

U.S. Cl. 33—560 **10 Claims**



1. An apparatus for measurement of the classification characteristics of the carcases of animals slaughtered for meat, comprising a vertical supporting stand (**118**) equipped with means of positioning the half-carcases of these animals and with displaceable feeler means, characterized in that the verti-

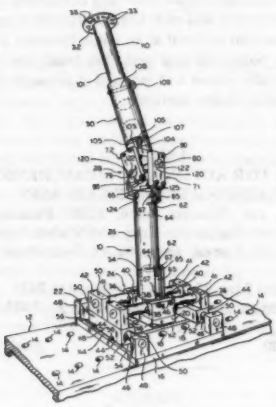
cal supporting stand (118) is equipped with a frame (119) the position of which is adjustable in the horizontal direction and in its slope with respect to the vertical, its bottom end being further from the vertical stand (118) than its top end, a plate (127) is mounted to slide up and down this frame (119), a projecting stop (135) having a reference face (136) is attached at the upper portion of the plate (127) to its front face which is intended for being turned towards the half-carcases which are to be measured, and this frame (119) carries the various displaceable means comprising measuring feelers which have members emitting signals in relation to their displacements and their positions, the projecting stop (137) being arranged on the plate (127) in order that its reference face shall encounter a predetermined point such as the bone of the ischiopubic protuberance when it is a question of a half-carcase, in consequence of the sliding of the plate (127) in the frame (119).

4,549,359

DATUM POINT LOCATION METHOD AND APPARATUS

Thomas R. Hense, New Berlin, and Ronald M. Rudolph, Oak Creek, both of Wis., assignors to Applied Power, Inc., Brookfield, Wis.

Filed Nov. 17, 1983, Ser. No. 552,769
Int. Cl.[4] G01B *5/03, 5/14*
U.S. Cl. 33—516 **10 Claims**



1. Apparatus for locating and securing a datum point in space relative to a support frame, the combination including:

a support base having coupling means for securing the support base in various discrete positions on said support frame,

first coupling means adjustably mounted on said base for movement in two mutually perpendicular directions,

means for locking said first coupling means in discrete positions on said support base,

first elongate means secured to said coupling means and extending in a direction perpendicular to the plane defined by said first and second directions,

universal coupling means mounted at the remote end of said first elongate means and including a second coupling means and means for securing the second coupling means in any vertical and horizontal angular orientation relative to the remote end of the first elongate means,

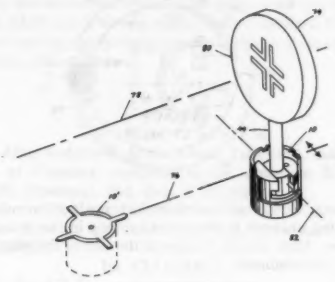
a second elongate means fixed at one end to said second coupling means and being extendably adjustable longitudinally whereby the remote end of the second elongate means may be positioned at a predetermined point in space relative to a point on said base.

4,549,360

DEVICE FOR ALIGNMENT OF PROCESS EQUIPMENT AND METHOD OF USE THEREOF

Frank L. Allen, Montclair, N.J., assignor to Algate Instrument Corp., Montclair, N.J.

Filed Jul. 19, 1984, Ser. No. 632,228
Int. Cl.[4] G01C *15/00*
U.S. Cl. 33—293 **19 Claims**



1. An improved alignment target mount for permanent installation along an optical line-of-sight comprising:

(a) a cylindrical body comprising, in turn;

(1) a hollow casing with a longitudinal axis substantially positionable within the vertical plane including said line-of-sight;

(2) plug means rotatably attached to the inner casing wall with a rotatably positionable slideway thereacross;

(3) an alignment target base slidably supported by the slideway of said plug means and adjustable along a line predetermined by the rotational position of said plug means, said target base including means for supporting an alignment target having a longitudinal axis with said axis parallel to said vertical plane; and

(4) locking means for affixing said target base to said plug means; and,

(b) a demountable alignment target assembly affixable to said alignment target base;

whereby, in a permanently installed unit, said demountable target assembly is mountable during the use of said optical line-of-sight, demountable therefrom, and remountable on said optical line-of-sight without further adjustment.

4,549,361

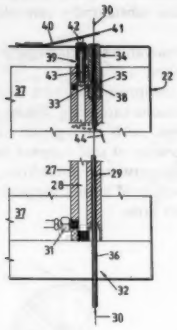
YARN HEATER

Denys W. Brough, and Christopher J. Lawrence, both of Macclesfield, England, assignors to Rieter-Scragg Limited, Cheshire, England

Filed Nov. 30, 1983, Ser. No. 556,326
Claims priority, application United Kingdom, Dec. 10, 1982, 8235326; Mar. 19, 1983, 8307666
Int. Cl.[4] F26B *7/00, 20/00*
U.S. Cl. 34—17 **11 Claims**

1. In a multi-station yarn texturing machine having a yarn heater comprising a heat transmission plate; heating means operable to heat said plate; and, for each yarn, means defining a heated yarn path; each of said yarn path defining means comprising a tube having an inlet end an outlet end, being mounted in good thermal contact with said plate, and having two substantially parallel bores extending therethrough, and a communicating inlet extending between said bores adjacent said inlet end; a method of heating a yarn comprising passing a yarn through one of said bores in contact with said tube over at least a portion of said one of said bores which is sufficiently long so that efficient transfer of heat between said tube and the yarn can occur; passing a fluid along the other of said bores in

a direction from said outlet end to said inlet end, thereby heating said fluid therein; and passing said heated fluid through said



communicating inlet to impinge upon said yarn as it travels along said yarn path.

4,549,362

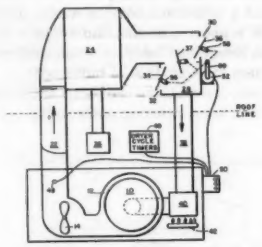
PROGRAMMABLE AIR RECIRCULATOR/MIXER FOR A FABRIC DRYER

John C. Haried, 1616 Kenilworth Pl., Aurora, Ill. 60506

Continuation-in-part of Ser. No. 340,746, Jan. 19, 1982,. This application Dec. 27, 1983, Ser. No. 565,476

Int. Cl.[4] F26B *21/10*

U.S. Cl. 34—31 **35 Claims**



1. In an air recovery and reuse drying system having an exhaust damper movable to a plurality of positions for selectively diverting air to be recirculated or exhausted during a drying cycle, an adjustable fresh air damper for controlling the amount of fresh air entrained into said system, a source of heat for heating air in said system, an improved damper control system comprising:

motive means connected to said exhaust damper and to said fresh air damper for adjusting each of said dampers to any one of the plurality of desired position;

monitor means operative to sense movement of air within said system and to produce a signal corresponding thereto;

temperature sensing means for sensing the temperature of the air within said system and producing a signal corresponding thereto;

processor means with a plurality of inputs for accepting input of said monitor means signal and said temperature sensing means signal and for generating a plurality of output signals to drive said motive means to adjust said exhaust damper and said fresh air damper to a corresponding plurality of positions allowing the air within the system to achieve a predetermined temperature thereby preventing build up of a positive air pressure in at least a portion of said system and for minimizing the fresh air admitted into said system during a latter part of said drying cycle while increasing the amount of hot air being recirculated.

4,549,363

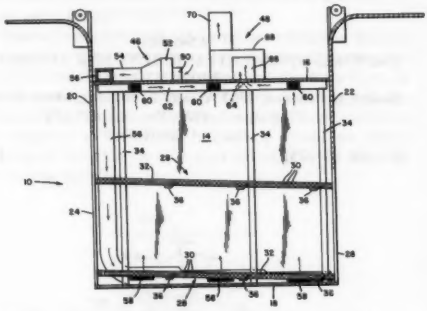
APPARATUS FOR HOT DEGASSING RESIDUAL OLEFIN OXIDE FROM STERILIZED PRODUCT

Anthony J. Buonicore, Fairfield, Conn., assignor to Buonicore-Cashman Associates, Inc., Bridgeport, Conn.

Filed Feb. 2, 1984, Ser. No. 576,434

Int. Cl.[4] F26B *19/00*

U.S. Cl. 34—216 **12 Claims**



1. A dedicated apparatus for degassing a sterilized product from a predetermined sterilizer, said apparatus operating independently of said sterilizer and sterilization cycle, said apparatus comprising:

a cell for degassing olefin oxide from a sterilized product;

at least one conveying means in said cell for conveying said product through said cell, said conveying means being inclined for gravitational movement of said product through said cell;

a plurality of stop means disposed along said conveying means for holding said product at a predetermined position for flow of air therebetween;

air handling means for forcibly drawing air into said cell and forcibly exhausting air from said cell to maintain a negative air pressure therein;

air heating means for heating air forced into said cell before air is exhausted from said cell by said air handling means, said air heating means and said air handling means maintaining the air throughout said cell at a pre-selected temperature; and

means for isolating said cell during the degassing of said sterilized product.

4,549,364

APPARATUS AND METHOD FOR MAKING SNOW ROADS

Patrick O'Connor, Dryden, Mich., assignor to Thermal Power Corporation, Almont, Mich.

Filed Oct. 26, 1984, Ser. No. 665,288

Int. Cl.[4] E01H *5/00*

U.S. Cl. 37—197 **18 Claims**

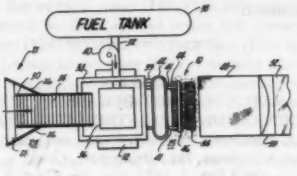
1. A method for laying a snow road on a snow surface, comprising the steps of:

delivering a predetermined amount of snow;

melting the snow so delivered to water;

mechanically working the snow remaining on the snow surface;

mechanically mixing said water with the mechanically worked snow remaining on the snow surface; and



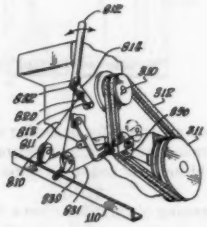
leveling the mixture of water and snow so formed;
allowing said mixture to freeze so as to form a road surface.

4,549,365

SNOW REMOVING ATTACHMENT FOR AUTOMOTIVE VEHICLES

Donald L. Johnson, 2303 Avenue B, Billings, Mont. 59102

Filed Apr. 5, 1984, Ser. No. 597,128
Int. Cl.⁴ E01H *5/09*
U.S. Cl. 37—251 **1 Claim**



1. In combination with a light automotive vehicle, a snow removing apparatus comprising: a frame work mounted upon said automotive vehicle; an engine with power output means carried by said frame work; a first snow removal device comprising a spiraling auger carried upon a shaft connected to said power output means in such manner that the power output means will impart rotary movement thereto; a second snow removal device independently powered by said power output means located proximate the center of the first snow removal device, so positioned as to receive snow from the first snow removal device and dierected in a direction perpendicular to which snow was being was being removed by the first snow removal device; clutch means interposed between the power output means and the two snow removal devices; brake means cooperatively connected to the clutch means so that when the clutch means is disengaged the brake means will apply braking force to both snow removal devices; a snow directional chute so positioned as to receive snow from the second snow removal device and direct the snow to a desired position; and means to intermittently activate or deactivate the apparatus as may be desired.

4,549,366

ADJUSTABLE NEEDLEWORK STAND

Beverly J. Gerding, and Richard W. Haller, both of 14339 Carolcrest, Houston, Tex. 77079

Filed May 21, 1984, Ser. No. 612,661
Int. Cl.⁴ D06C *3/08*
U.S. Cl. 38—102.2 **3 Claims**

1. A stand supporting an embroidery hoop for adjustable pivotal and rotary movement comprising:

a base formed of square tubing comprising a pair of horizontal parallel leg members and a crossmember secured transversely substantially centrally therebetween,

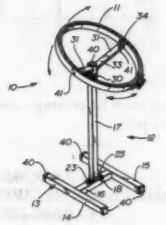
a pedestal member formed of square tubing extending vertically from said base substantially centrally of said cross member,

a plurality of bolts removably securing said pedestal member on said cross member,

a support member comprising a short section of square tubing rotatably attached to said pedestal member,

a pair of support arms, each having one end pivotally attached to opposite sides of said support member and another end extending outwardly therefrom,

an embroidery hoop secured to and supported between the ends of said support arms,



a bolt securing said support member on said pedestal member and a nylon anti-friction washer interposed between said support member and said pedestal member attaching said support member to said pedestal member for 360° rotary movement thereon, and

a bolt pivotally attaching said support arms to said support member and a nylon anti-friction washer interposed between each support arm and said support member and operable to retain said hoop in a selected pivotally adjusted position through 180° of movement,

each of said bolts comprising a cap screw and a lock nut with an elastomeric insert resisting unthreading.

4,549,367

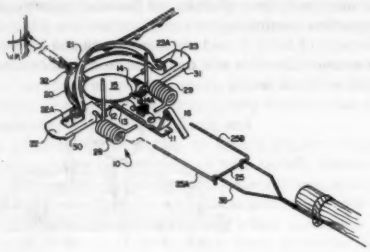
APPARATUS AND METHOD FOR QUICK RELEASE MECHANISM FOR ANIMAL TRAP

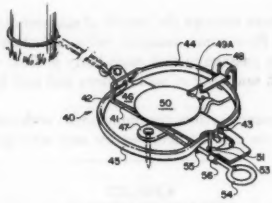
Hoxie D. Jones, Sr., 17 Fifth Ave., Thomasville, N.C. 27360

Filed May 29, 1984, Ser. No. 614,563
Int. Cl.⁴ A01M *23/26*
U.S. Cl. 43—88 **7 Claims**

1. A spring-activated, leg hold animal trap of the type wherein a pan is pivotally mounted on a trap frame in a horizontal position with a shank for engaging a dog which holds the trap in an open position, and upon depression of the pan the dog is released and at least one spring-loaded lever and snaps a pair of trap jaws together, the improvement comprising a quick release mechanism for releasing the jaws from the leg of the trapped animal, and comprising means for releasing the spring from the lever whereby the jaws are permitted to assume an open position without spring tension thereon, wherein the means for releasing the spring from the lever while the trap is in the open position comprises a releasable pin which holds

the lever in spring-tensioned relation when in a locked position and is mounted for releasement out of the locked position into





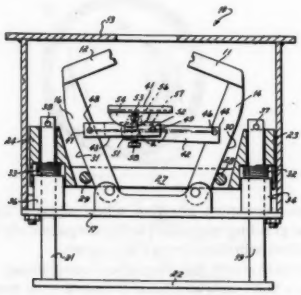
an unlocked position wherein spring tension on said lever is released.

4,549,368

ANIMAL TRAP

Robert G. Bustle, R.R. #1, Versailles, Ind. 47042

Filed Aug. 3, 1984, Ser. No. 637,429
Int. Cl.[4] A01M *23/24*
U.S. Cl. 43—88 **4 Claims**



1. An animal trap comprising:

a housing including a base and having an access opening;

a pair of arms each pivotally mounted on the base of the housing and each having a free end forming a jaw, the arms being positioned relative to one another so that the arms are pivotable between (a) a jaws open position in which the arms are pivoted away from one another and the jaws spaced apart and (b) a jaws closed position in which the arms are pivoted toward one another and the jaws urged into engagement;

a pair of vertical posts extending into the housing through the base;

a drive frame slidably mounted on the vertical posts including a pair of surfaces, each normally contacting a different one of the arms;

means for urging the drive frame upwardly along the vertical posts from (a) a lower position in which the arms are free to pivot into the jaws open position to (b) an upper position in which the arms are urged into the jaws closed position by the arm-contacting surfaces of the drive frame;

means for moving the drive frame into its lower position in order to permit setting the trap, the means for moving the drive frame into its lower position comprising a handle outside the housing attached to the pair of vertical posts, each post including means in the housing for engaging the drive frame, whereby the handle may be drawn away from the housing, withdrawing the post from the housing, moving the drive frame toward the base out of engagement with the arms so that the arms are free to pivot to the jaws open position; and

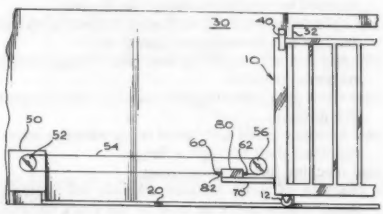
trip means coupled between the arms for releasably locking the arms in the jaws open position when the arms are pivoted into the jaws open position with the drive frame in its lowered position, thereby setting the trap, and for releasing the locking of the arms in the jaws open position in response to movement of the trip means to permit urging of the arms into the jaws closed position, thereby springing the trap.

4,549,369

DRIVE-ACTUATED LATCHING DEVICE FOR A SECURITY PARKING GATE

Daniel M. Foley, Jr., Los Angeles, Calif., assignor to Fred Brail, Inglewood, Calif., a part interest

Filed Dec. 2, 1983, Ser. No. 557,428
Int. Cl.[4] E05F *15/00*
U.S. Cl. 49—279 **27 Claims**



1. A latching device for a security gate driven by a chain drive, comprising:

a housing fixedly connected to said security gate;

a control member movably mounted in said housing and extending outwardly therefrom, said control member having a first position and a second position, said control member being driven from said first position to said second position by said chain drive when said chain drive is actuated to open said security gate;

a lock member slidably mounted in said housing, said lock member having a locked position in which said lock member extends outwardly from said housing, and an unlocked position in which said lock member is drawn inwardly into said housing; and

means for activating said lock member in response to said control member to cause said lock member to be driven from said locked position to said unlocked position when said control member moves from said first position to said second position.

4,549,370

MACHINE FOR FINISHING COMPLEX PROFILED WORKPIECES

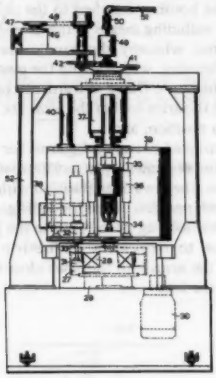
Boris G. Makedonski, and Haralampi A. Atanassov, both of Sofia, Bulgaria, assignors to Centralen Mashinostroitelen Institute, Sofia, Bulgaria

Filed Jan. 18, 1983, Ser. No. 458,997

Claims priority, application Bulgaria, Jan. 18, 1982, 55025

Int. Cl.⁴ B24B *31/08*

U.S. Cl. 51—7 **1 Claim**



1. A machine for finishing complex profiled workpieces comprising a plurality of rotating barrels wherein the workpieces are machined, and an unloading/loading unit;

each said barrel having a torus-shaped work area defined by a bottom and cylindrical walls fixed to the bottom;

said torus-shaped work area of each said barrel being closed at its top by a torus-shaped stationary magnetic pole piece;

an electromagnetic coil and a disc mounted on said magnetic pole piece by a fixed shaft in the center of the space surrounded by said torus-shaped work area;

the cylindrical walls of said torus-shaped work area being made of non-ferromagnetic material;

the disc and bottom of the fixed shaft being made of ferromagnetic material;

said work area containing containing a ferromagnetic abrasive mixture;

said bottom of each said barrel being rotatably supported on said fixed shaft through a flange;

said machine further comprising:

a plurality of work stations wherein the workpieces are clamped in a chuck at each of the work stations, means including air cylinders to reciprocate the chucks vertically, and means including electric motors and reduction gears for rotating the chucks;

wherein the top magnetic pole pieces are indexed along with the work stations by a second disc with a cog and a Geneva wheel when said work stations are in their lower position, and it is only in one indexing position that each respective work station is moved upwardly by its air cylinder.

4,549,371

DUST COLLECTING APPARATUS FOR SANDER

Kouzou Hakoda, Hiroshima, Japan, assignor to Ryobi Ltd., Hiroshima, Japan

Filed Jun. 8, 1984, Ser. No. 618,786

Claims priority, application Japan, Jun. 27, 1983, 58-99737[U]

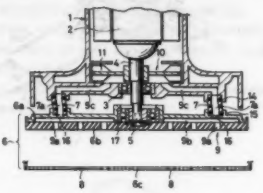
Int. Cl.⁴ B24B *23/00, 55/06*

U.S. Cl. 51—170 MT **10 Claims**

1. A dust collecting apparatus for a sanding machine having a rotary driven shaft within a main body, fan blades mounted on said shaft disposed to rotate within a fan chamber, a sanding platen comprised of an upper drive platen and a lower sandpaper engaging layer, said sanding platen being driven by an eccentric portion of said shaft, said sanding platen being affixed to said main body by a plurality of flexible support columns, said apparatus comprising:

a plurality of holes in said sandpaper engaging layer;

at least one channel in said drive platen in flow communication with said holes;



a hollow bore through the length of said columns, said bore being in flow communication with said channel;

at least one passage in said main body in flow communication with said bore of said column and said fan chamber; and

discharge means in flow communication with said fan chamber and the environment outside said main body.

4,549,372

GRINDING WHEEL

John S. Sexton, Windsor; Brian J. Stone, Bristol; Trevor D. Howes, Bristol, and Colin Andrew, Bristol, all of England, assignors to De Beers Industrial Diamond Division (Proprietary) Limited, Johannesburg, South Africa

Continuation of Ser. No. 248,905, Mar. 30, 1981, abandoned. This application Dec. 8, 1983, Ser. No. 559,007

Claims priority, application United Kingdom, Apr. 2, 1980, 8010991

Int. Cl.⁴ B24D *13/12*

U.S. Cl. 51—206 R **10 Claims**

1. A semi-permanent grinding wheel suitable for use in a shallow-cut grinding operation, with comparatively low unstable self-excited vibration known as chatter,

said semi-permanent grinding wheel comprising:

as a base, a hub constructed and arranged to be rotated about a centrally disposed longitudinal axis;

as a radially outer circumferential rim, an annular structure including a radially outer layer of abrasive particles of ultrahard abrasive grit selected from the group consisting of natural diamond, synthetic diamond and cubic boron nitride bonded in a matrix; and

an intermediate annular structure by which said rim is borne on said hub for rotation therewith, said intermediate annular structure including:

two oppositely disposed margins including one constructed and arranged for contiguousness with said rim and another constructed and arranged for contiguousness with said hub, and

a core disposed between said margins, said core being constructed and arranged to be resiliently deformable;

at least one of said intermediate annular structure and said annular structure which provides said rim further including an annular support functionally interposed in supporting relation between said radially outer layer of abrasive particles and said resiliently deformable core of said intermediate annular structure;

said grinding wheel having so low an oscillating mass, that its first radial natural frequency, measured by exciting the wheel on its radially outer periphery while its hub is held stationary, is at least 500 hertz; and

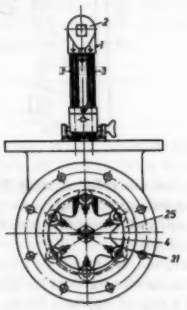
said grinding wheel having so high a degree of resilient deformability in said core of said radially intermediate annular structure, that its radial static stiffness, determined by measuring the force applied inwards in the radial direction to the rim of the grinding wheel across the entire width of the rim (at an angularly small site on the rim) per unit radial deflection of the grinding wheel rim at that site, is less than 1.5×10^6 newtons per meter per mm of wheel rim width.

4,549,373

APPARATUS FOR GRINDING AND LAPPING ANNULAR SEALING FACES

Ranko F. F. Effenberger, Zum Wibbelrusch 6, 5160 Düren, Fed. Rep. of Germany

Continuation of Ser. No. 555,556, Nov. 28, 1983, abandoned.
This application Feb. 28, 1985, Ser. No. 705,869
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1983, 8303975[U]
Int. Cl.[4] B24B *15/02*
U.S. Cl. 51—241 A **5 Claims**



1. Apparatus for grinding and lapping annular sealing faces in valves, slides and the like, comprising a mounting securable to the workpiece and having on one side a drive and on the other side a rotable tool plate which is coupled to the drive by a transmission element and carries a series of freely rotatable grinding or lapping heads with axes parallel to the tool plate axis, the heads being radially adjustable relatively to the tool plate, the tool plate (4) has a bearing hole (15) which is offset from its mid-point and in which a circular bearing plate (10) is adjustably mounted, a drive pin (5) which is coupled to the transmission element being secured off-centre to the bearing plate for rotation therewith.

4,549,374

METHOD FOR POLISHING SEMICONDUCTOR WAFERS WITH MONTMORILLONITE SLURRY

Jagtar S. Basi, Fishkill, and Eric Mandel, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 407,403, Aug. 12, 1982, abandoned.
This application Jan. 14, 1985, Ser. No. 690,917
Int. Cl.[4] B24B *1/00*
U.S. Cl. 51—283 R **6 Claims**

5. A method of polishing a silicon semiconductor wafer surface comprising:

(a) applying to said silicon wafer surface by means of a polishing pad a polishing slurry consisting of 2–10 percent by weight of colloidal montmorillonite mineral admixed with deionized water and the alkaline compound of NaOH, said alkaline compound being in an amount sufficient to adjust the pH value of the slurry to be in the range of 9.5–12.5, to cause a chemical reaction of said NaOH with said silicon surface and form thereon the alkaline metal silicate of Na_4SiO_4; and

(b) mechanically removing said Na_4SiO_4 from said surface with said montmorillonite by rubbing said surface with said pad,

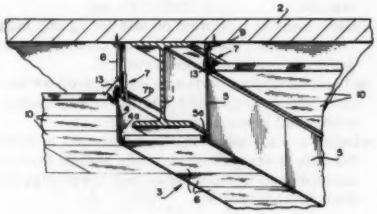
whereby said silicon wafer surface is rendered free of undesirable crystal defects and surface imperfections while causing minimal degradation of said polishing pad.

4,549,375

CEILING CONSTRUCTION

Martin Nassof, Cliffside Park, N.J., assignor to Simplex Ceiling Corporation, Hoboken, N.J.

Filed Jun. 7, 1983, Ser. No. 501,845
Int. Cl.[4] E04B *5/52*; G09F *7/18*
U.S. Cl. 52—39 **5 Claims**



1. A unit for use in a metal ceiling panel suspended ceiling, which comprises:

a. an elongated snap bar comprising spring-like arms extending from a common, integrally formed base portion and terminating in opposed free ends biased towards one another;

b. vertically disposed first and second members held within said spring-like arms and depending from said snap bar;

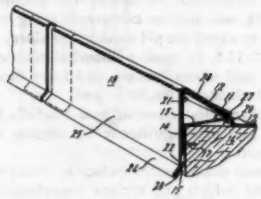
c. said first member having a vertically disposed portion held within said snap-bar and a horizontally disposed portion terminating in a free end;

d. said second member having a planar body portion with one horizontal edge thereof held within said snap-bar and with a clip portion longitudinally extending along and positioned above the opposite horizontal edge of said body portion, said clip portion having a spring-like arm integral with said body portion terminating in a free end biased toward said body portion, said clip portion facing away from said horizontally disposed portion;

e. a metal ceiling panel having a horizontally disposed planar bottom portion and a pair of opposed vertically disposed side walls, one of which being snap-fitted into said clip portion, whereby said planar bottom portion of said panel is perpendicular to said body portion; and

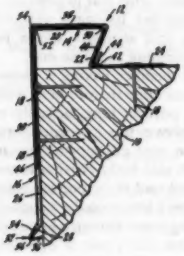
f. the vertical height of said vertically disposed portion of a said first member being less than the vertical height of said body portion of a said second member held within the same snap-bar therewith.

4,549,376
ROOF EDGE CONSTRUCTION
John B. Hickman, Asheville, N.C., assignor to W. P. Hickman Company, Asheville, N.C.
Filed Oct. 6, 1981, Ser. No. 309,062
Int. Cl.[4] E04D *13/15*
U.S. Cl. 52—94 **5 Claims**



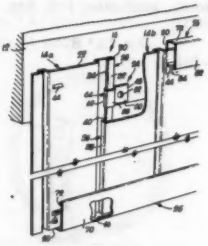
1. An assembly for formng a raised roof edge on a building structure having a generally vertical outer face, comprising:
a spring clip member having a generally vertical portion for attaching to said outer face, said vertical portion having a lower edge and having an inwardly directed face for confronting said outer face;
said spring clip having a first sloping portion extending generally upwardly and inwardly and having a second sloping portion extending further upwardly and outwardly;
a fascia member supported on said spring clip member, said fascia member having a lower channel portion and a generally concave upper portion;
said second sloping portion being received within said concave upper portion and said lower edge being received within said lower channel portion;
wherein at least said first sloping portion is resiliently deflectable in response to manually applied forces to permit assembly and disassembly of said lower edge within said lower channel portion.

4,549,377
TWO-PIECE SNAP-LOCK FACIA BORDER
Gary M. Castle, 4854 Forster, Schiller Park, Ill. 60176
Filed Aug. 24, 1983, Ser. No. 526,004
Int. Cl.[4] E04B *7/09*
U.S. Cl. 52—94 **8 Claims**



1. A two-piece facia border attachable to the peripheral edge of a roof structure for anchoring layered roofing material thereto, comprising:
an elongate base member attachable to said roof structure and having an engaging box-like portion, said box-like portion including a side surface angled downwardly and inwardly into said box-like portion toward an opposite side surface of said box-like portion, and said base member further having a first fastening means for attachment to the top of said roof structure and a second fastening means for attachment to the side of said roof structure, said second fastening means having an engaging means along a marginal edge thereof;
an elongate cap member having a top portion thereof pivotally fittable over said box-like portion in an over the center manner so as to be compressibly fittable on said box-like portion for sandwiching therebetween said roofing material, the top portion of said cap member having a downwardly and inwardly depending leg corresponding to an angled side surface of said box-like portion, said leg being angled toward an opposite leg of said cap member, and which leg includes a rounded edge engageable with said side surface of said box-like portion, said cap number further including an engagement means for captive engagement with the engaging means of said second fastening means.

4,549,378
MOBILE HOME SKIRTING SYSTEM
Ralph L. Ayers, Kearney; Garfield W. Stovin, and Robert J. Szabo, both of Kansas City, all of Mo., assignors to Varlform Plastics, Inc., Kearney, Mo.
Filed Jun. 13, 1983, Ser. No. 503,715
Int. Cl.[4] E04D *1/00*
U.S. Cl. 52—169.12 **7 Claims**



1. A skirting assembly for closing the space beneath an elevated building and comprising:
a plurality of upright panels disposed in a generally end-to-end relationship;
means for interconnecting said panels to present a substantially continuous closing skirt having an elongated upper margin and a pair of opposed faces;
connector means for securing said skirt beneath said building, and for permitting up and down reciprocal travel of the skirt, including structure for fixed securement to said building and means operably coupled with said structure for engaging said skirt in a manner to permit said travel thereof, at least certain of said panels having an elongated, upright slot therein, said connector means comprising screw means extending through respective slots for fixed securement to said building; and
cover means for covering said upper margin and including an elongated channel member of inverted, generally U-shaped configuration having depending legs, said channel member being positioned over a portion of said upper

margin with said legs respectively disposed proximal to one of the opposed faces of said skirt,

said channel member being free of fixed securement to said building for up and down movement of the channel member with said movement of said skirt.

4,549,379

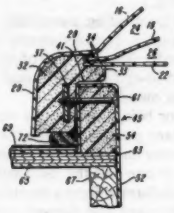
SKYLIGHT ASSEMBLY

Walter S. Hoy, and Donald L. Roettele, both of 4518 Taylorsville Rd., Dayton, Ohio 45424

Filed Feb. 7, 1983, Ser. No. 464,651

Int. Cl.[4] E04B *7/18*

U.S. Cl. 52—200 **11 Claims**



1. A skylight assembly comprising an outer panel of light transmitting sheet material, a inner panel of light transmitting sheet material, said inner and outer panels having corresponding outer peripheral edge portions, means including a frame of substantially rigid plastics foam material for connecting said outer peripheral edge portions of said inner and outer panels and for forming a fluid-tight seal therebetween, said peripheral edge portion of said outer panel extending around said frame in covering relation and forming a peripheral skirt portion depending downwardly around said frame, said frame defining an inner peripherally extending recess adapted to receive a correspondingly shaped curb member projecting upwardly from a roof surface around a skylight opening within the roof, the members embedded within said foam material for receiving threaded fasteners extending through the curb member for securing said frame to the curb member.

4,549,380

SEALING MEANS FOR WALL MEMBERS AND WALL MEMBER FOR PARTITION WALLS

Karl Haab, Ober Weidstrasse 7, Rotkreuz, Switzerland, assignor to Otto Haab, Mettmemstetten, Switzerland

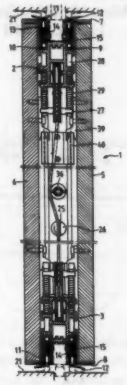
Filed Nov. 14, 1983, Ser. No. 551,159

Claims priority, application Switzerland, Nov. 16, 1982, 6679/82

Int. Cl.[4] E04B *2/82*

U.S. Cl. 52—240 **9 Claims**

1. A wall member for abutting multimember partition walls, comprising a rectangular frame covered on each face by a wall panel, said frame having upper and lower profiles and a pair of connecting lateral profiles, the outer edges of each of said upper and lower profiles having at least one groove in which is mounted a seal capable of being raised and lowered with respect to the profile into contact with a spaced surface, the outer edges of each of said lateral profiles being provided with a cover fixed thereto extending above and below the outer edge of said upper and lower profile respectively, said cover having a recess at its upper and lower ends through which said seals extend, and means for displacing said seals comprising a cable attached at each end to said frame, a winch mounted within said frame for winding said cable, a pulley secured to each of said seals respectively and over which said cable is



entrained to selectively displace said seals between a lifted position and a lowered position on operation of said winch.

4,549,381

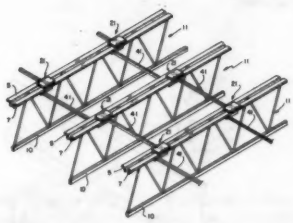
COMPOSITE JOIST SYSTEM

Neal Holtz, 1900 Lyttonsville Dr., #716, Silver Spring, Md. 20910

Filed Nov. 2, 1983, Ser. No. 548,187

Int. Cl.[4] E04B *1/16*

U.S. Cl. 52—337 **9 Claims**



1. A method of erecting formwork for pouring a slab in place on substantially parallel steel joists, each joist being in the form of a truss having an open web, a top chord and a bottom chord, said top chord comprising a pair of spaced-apart parallel metal bars welded to opposite sides of said web, said method comprising:

installing a plurality of T-shaped spanner bar support clips at spaced-apart positions on said joists, each of said support clips being substantially aligned with at least one support clip at an adjacent joist, each of said support clips comprising a horizontal plate member adapted to be supported on the top chord by the upper surface of said spaced-apart metal bars, a vertical plate member adapted to extend between said spaced-apart metal bars into the open web portion of said joist, and aperture means in said vertical plate member to accommodate and support a spanner bar;

inserting opposite ends of spanner bars into the aperture means of aligned support clips; and

placing concrete form panels on said spanner bars.

4,549,382

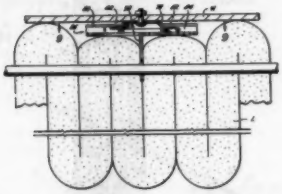
FIBER BLANKET INSULATION MODULE

Carlisle O. Byrd, Jr., Houston, Tex., assignor to Manville Service Corporation, Denver, Colo.

Filed Mar. 16, 1983, Ser. No. 475,855

Int. Cl.³ E04B *1/80*

U.S. Cl. 52—506 **28 Claims**



1. In an apparatus for attaching a module of refractory fiber blanket to a surface such as a furnace wall, said apparatus including at least one support rod suspended in said module by a suspension arm member means adapted to receive said support rod, and means, attached to said surface, for mounting said module, the improvement comprising:

at least one locking tongue cooperative with said suspension arm member means and said mounting means for locking said suspension arm means to said mounting means upon slideable engagement thereof.

4,549,383

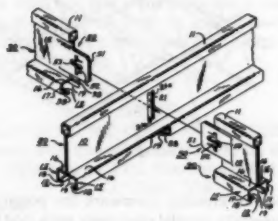
SUSPENDED CEILING GRID SYSTEM

Ronald W. Vukmanic, Naperville; John S. Borucki, Bloomingdale, and Chester A. Stanley, Des Plaines, all of Ill., assignors to Chicago Metallic Corporation, Chicago, Ill.

Filed Sep. 8, 1983, Ser. No. 530,379

Int. Cl.⁴ F16B *7/22*

U.S. Cl. 52—667 **9 Claims**



1. A support runner for use in forming a grid system in support of a suspended ceiling comprising

a beam member including a web extending vertically between a closed flange formed at an uppermost portion of said web and an open flange formed at a lowermost portion of said web,

said vertically extending web being formed of a double thickness of material which terminates at the lowermost portion of said web for forming said open flange,

said open flange being formed at the lowermost vertical portion of said web of double material thickness by separating said double thickness and extending a single thickness of material from the said double material thickness horizontally outwardly in opposed directions then vertically downward parallel to each other, and then horizontally inwardly toward each other with the terminal ends of each single thickness thereof being turned back upon itself forming an inwardly turned lip defining a parallel spaced opening in said flange,

said inwardly turned lip and said lowermost horizontally extending inwardly turned portion of said open flange having a beveled opening formed therein at a position spaced inwardly from the ends of said beam member for engagement by another support runner in forming a suspended ceiling grid system,

said beam web having a substantially H-shape opening formed therein including at least two locking members extending toward each other from upper and lower surfaces of said web by which a portion of said H-shape opening is formed at a position adjacent to said beveled opening formed in said inwardly turned lip and said lowermost horizontally extending inwardly turned portion of said open flange of a size sufficient to receive a portion of said other support runner when in engagement with said beveled opening,

a tab connector protruding outwardly from said web for engagement with a complementary tab connector protruding outwardly from the web of another beam member to form an end-to-end joinder of said beam member with the other beam member,

said tab connector being carried in a vertical plane parallel to a vertical plane passing through the longitudinal axis of said beam member and offset therefrom a distance approximately equal to one-half the thickness of said web,

an interlocking tab formed from a portion of said tab connector near the forward end thereof and having a trailing edge extending angularly outwardly from said tab connector for forming a portion of a locking connector to interlock said beam member to another beam member, and

a pocket for receiving the tab connector of another beam member, said pocket being formed from said web at a position adjacent to the rear of said tab connector,

said portion of said web from which said pocket is formed defining an edge for engagement by the tab connector of another beam member to interlock said beam member with the other beam member.

4,549,384

REINFORCING ROD HOLDER FOR USE IN CONNECTION-TYPE CONCRETE POURING OPERATIONS AND A METHOD OF PRODUCING SAME

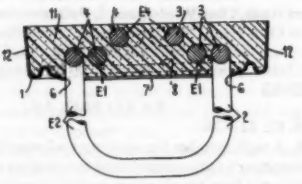
Fritz Brechbühler, Gümligen, Switzerland, assignor to Pebea N.V., Willemstad, Netherlands Antilles

Filed Aug. 16, 1983, Ser. No. 523,620

Claims priority, application European Pat. Off., Sep. 10, 1982, 82810378.8

Int. Cl.⁴ E04B *1/41*; E04C *1/00*

U.S. Cl. 52—704 **8 Claims**



1. A reinforcing rod holder for holding reinforcing rods having an anchor portion and at least one rod end comprising:

a hollow body portion having a depression and a plurality of apertures therethrough in communication with said depression for receipt of the rod ends in said depression through said apertures so that the anchor portions project away from said body portion; and

a filled-in-place, hardenable material cooperating with said body portion and the reinforcing rods by filing said depression and embedding the rod ends therein, so that said

body portion, said material and the reinforcing rods form a unitized, self-supporting structure.

4,549,385

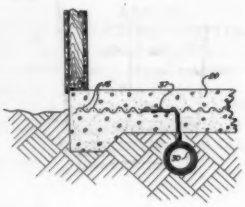
HANGER FOR SUPPORTING PIPE BELOW STEEL REINFORCED CONCRETE SLAB FOUNDATIONS

Alfred S. Cohen, 6125 General Haig, New Orleans, La. 70124, and Joseph C. Wessing, Jr., 3405 Blanchard Dr., Chalmette, La. 70043

Filed Sep. 12, 1984, Ser. No. 649,916

Int. Cl.[4] F16L *3/12;* **E04B** *1/00;* **E02D** *27/00*

U.S. Cl. 52—742 **9 Claims**



1. A method for installing pipe below a slab formed of steel reinforced concrete, comprising:

a. securing an elongated shaft of a preformed hanger to a reinforced steel portion of the formed slab foundation prior to the pouring of concrete;

b. preforming a hanger having an open loop at the bottom portion of an elongated shaft, the loop having a curved, generally circular body of less than three hundred sixty degrees (360°) which terminates at a point of beginning communicating with the shaft and a loop free end which includes a radial strut extending from the loop free end and away from the circular loop along a radial line originating at the loop center;

c. placing the pipe to be supported in the preformed loop after the shaft is secured to the reinforcing steel so that the pipe is preliminarily supported by the reinforcing steel with the preformed hanger;

d. closing the loop by connecting the radial strut and the hanger shaft together; and

e. pouring the concrete portion of the slab so that it encapsulates both the reinforcing steel and at least the portion of the hanger shaft above the loop.

4,549,386

FORM-FILL-SEAL WRAPPING APPARATUS

Peter G. Wilson, Leeds, England, assignor to Baker Perkins Holdings PLC, Peterborough, England

Filed Apr. 10, 1984, Ser. No. 598,812

Claims priority, application United Kingdom, Apr. 18, 1983, 83010440; Apr. 18, 1983, 83010441

Int. Cl.[4] B65B *57/00, 59/02, 51/26*

U.S. Cl. 53—51 **8 Claims**

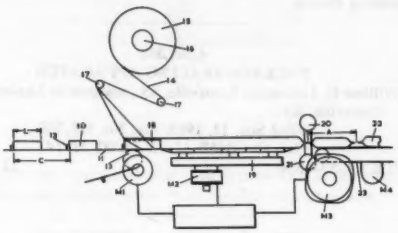
1. Horizontal form-fill-seal wrapping apparatus comprising an infeed conveyor which performs in a cycle to deliver at a fixed point in the cycle successive items of a train of product items to be wrapped, means for advancing a web of wrapping medium and folding and sealing the web longitudinally around the train, and a transverse sealing means which performs in a cycle to form at a fixed point in each cycle a transverse seal in the folded web between each successive items in the train, characterised in that the apparatus comprises:

i. a first motor, to drive the infeed conveyor, and an associated positional feedback device;

ii. a second motor, to drive the web advancing means, and an associated positional feedback device;

iii. a third motor, to drive the transverse sealing means, and an associated positional feedback device;

iv. a microprocessor control device to which is inputted signals from the said feedback devices and which outputs driving signals to the said motors; and



v. means to input the control device with data representative of the unit length of the wrapping web to be used to wrap each said product item, and representative of the number of product items to be wrapped per unit of time.

4,549,387

FLEXIBLE CONTAINER FILLING APPARATUS

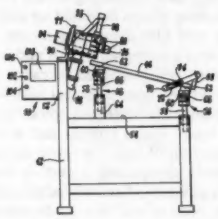
Stephen Marshall, Patterson Lakes, and Hung D. An, Oakleigh, both of Australia, assignors to ACI Australia Limited, Victoria, Australia

Filed Jul. 6, 1983, Ser. No. 511,203

Claims priority, application Australia, Jul. 7, 1982, PF4753; Jun. 15, 1983, PF9813

Int. Cl.[4] B65B *3/17, 51/14*

U.S. Cl. 53—469 **35 Claims**



1. Apparatus for packaging a liquid material in bag containers having an opening adjacent an edge of a substantially flat body thereof, comprising a support stand and, mounted thereon, a filling station, a sealing station and support means, said stations being in spaced side by side relation along a horizontally extending line; wherein said support means has a support surface which extends laterally with respect to said line from each of said stations, with said support means being movable backwards and forwards substantially parallel to said line such that successive containers received on said support surface are presented in turn to said filling station and said sealing station; said filling station having a filler head connectable to a source of supply of flowable material and having a nozzle extending laterally, with respect to said line, over said support surface, said nozzle being engageable in the opening of a container received on said support surface for discharge of said material laterally into the container; said filling station further including a pair of jaw members movable between a gripping position, in which they releaseably grip the container opening against the nozzle when the latter is received in said opening, and a retracted position; said sealing station having sealing means being connectable to an electric power source and being operable to grip said opening of a filled container

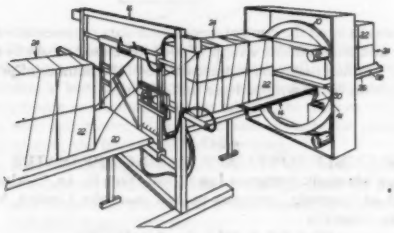
and form a heat seal thereacross; said support surface being closely adjacent said nozzle and sealing means such that the container received on said surface for presentation to said filling station has substantially its entire body extending laterally with respect to said line from said filling station, with said body extending similarly from said sealing means on movement of the support means to present the container to said sealing station.

4,549,388

PACKAGE SEALING APPARATUS

William G. Lancaster, Louisville, Ky., assignor to Lantech, Inc., Louisville, Ky.

Filed Sep. 13, 1983, Ser. No. 531,768
Int. Cl.[4] B65B *11/32, 53/00, 51/14*
U.S. Cl. 53—556 **23 Claims**



1. A wrapping apparatus for wrapping a plurality of loads and separating the loads into individually enclosed packages comprising a wrapping means, said wrapping means comprising a frame, a ring rotatably mounted in said frame, means to rotate said ring, film dispensing means mounted on said ring and film stretching means mounted on said ring to stretch film dispensed by said film dispensing means, a conveyor means positioned within a wrapping area of said wrapping means, said conveyor means being adapted to carry a plurality of loads through said wrapping area so that said wrapping means dispenses a continuously stretched spiral wrapped web of film around said loads, and a cutting and sealing assembly positioned downstream of said conveyor means, said cutting and sealing assembly comprising a cutting frame, a plurality of opposing film guide mechanisms reciprocally mounted on said cutting frame, each of said film guide mechanisms comprising a support frame, a plurality of angled members mounted on said support frame, said angled members defining a throat therebetween, means mounted to each of said film guide mechanisms to converge said guide mechanisms along said cutting frame to engage and confine said continuously stretched spiral wrapped web of film in said throat between successive loads, film clamping and seating means mounted in one of said guide mechanisms and heat generation means mounted to another one of said guide mechanisms opposite said clamping and seating means to engage said clamping and seating means to sever and seal the film wrap confined in said throat to enclose a load.

4,549,389

PRECHARGED CONTAINERS

Theodore B. R. Zichy, 8 Sandwich St., London WC1H 9PL, England

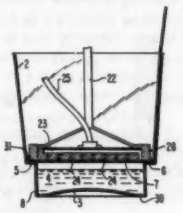
Filed May 5, 1983, Ser. No. 491,989
Int. Cl.[4] B65B *29/06, 7/28, 51/10*; **A47G** *19/22*
U.S. Cl. 53—471 **5 Claims**

1. A method of hermetically sealing a liquid receiving chamber located at the lower section from a liquid receiving chamber located at the upper section of a stackable disposable container of plastics material, in which the two chambers connect with each other by way of a peripheral step or ledge between said chambers, the method including the step of;

forming a lid or cover producing blank from a plastics or metallic material having the thickness of foil, the blank being of such dimensions that it may be secured to the step or ledge and also to provide a peripheral skirt region;

supporting the blank such that the blank may be brought into contact with the step or ledge;

bringing the blank, after the liquid has been introduced into the lower section, into co-operation with the ledge in such



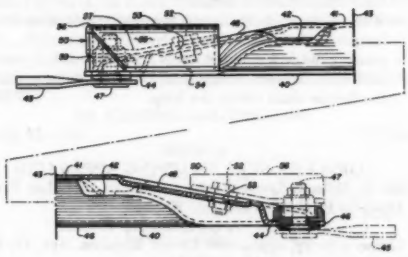
manner that the blank covers in the chamber; exerting pressure upon that part of the blank that is in co-operation with the step or ledge whilst simultaneously heating the said part to a temperature that following removal of the pressure and heating the part has been so adhered to the step or ledge as to produce a hermetic seal between the said part and the step or ledge whilst said peripheral skirt region and said container are not adhered, said hermetic seal permitting subsequent removal of said lid or cover by a peeling operation.

4,549,390

CROP LIFTER FOR DISC MOWER-CONDITIONERS

Kenneth W. McLean, New Holland, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Mar. 23, 1984, Ser. No. 592,642
Int. Cl.[4] A01D *55/18, 35/264*
U.S. Cl. 56—13.6 **11 Claims**



1. In a disc mower-conditioner having a mobile frame adapted for forward movement over the ground; rotary cutting means supported by said frame adjacent the ground to sever standing crop material, said rotary cutting means including a transverse cutterbar rotatably mounting a plurality of transversely spaced cutter units having at least one knife operable to sever standing crop material upon rotation of said cutter units, each said cutter unit further including a disc rotatable about a centrally positioned axis of rotation, each said disc having a raised central portion and a lower peripheral portion, said at least one knife being connected to said peripheral portion; crop conditioning means mounted generally rearwardly of said rotary cutting means to condition crop material severed by said cutter units, the improvement comprising:

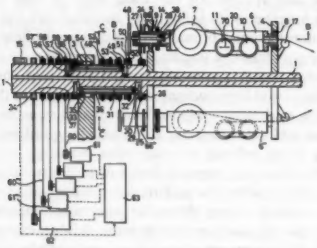
an inclined ramp lifter affixed to each said cutter unit adjacent said at least one knife in leading relationship thereto, as seen looking in the direction of rotation of the respective said cutter unit, to lift previously severed crop material away from said at least one knife before said at least one knife severs said standing crop material, each said lifter ramp extending upwardly from a leading edge to a trailing edge when seen in the direction of rotation, said trailing edge being positioned adjacent the corresponding said at least one knife, the trailing edge of each said lifter ramp being at substantially the same height as the raised central portion of the corresponding disc.

4,549,391

WIRE-LIKE STRUCTURE TWISTING MACHINE

Yuichi Toda; Katsuji Sakamoto; Shigeru Tanaka, and Yuji Kameo, all of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 17, 1984, Ser. No. 571,751
Claims priority, application Japan, Jan. 17, 1983, 58-6329
Int. Cl.[4] D07B *3/06, 7/02*
U.S. Cl. 57—13 **6 Claims**



1. Apparatus for twisting a plurality of wirelike structures into a cable with a twisting-back angle, comprising; a plurality of bobbins, a plurality of cradles each having an axially mounted supporting shaft, a cage, and a cage rotating spindle, wherein said wire-like structures are wound on said plurality of bobbins, each of which is supported in said cage, said cage rotating around said cage-rotating spindle, a separate driving system for each said bobbin, respectively comprising, a first chain sprocket coupled axially on said cradle, a chain wheel coaxial with said cage-rotating spindle and rotatable with respect to said cage-rotating spindle, a plurality of motors provided externally to said cage, and a rotation transmission means disposed internally of said respective chain wheel to engage an inner side surface of said chain wheel so that said respective chain wheels are driven by said rotation transmission means at said inner surface by said motors, wherein said motors control the bobbin feeding speed of said wire-like structures so as to twist said wire-like structures with constant tension.

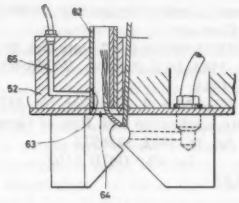
4,549,392

YARN SPLICING DEVICE FOR SPUN YARNS

Hidetoshi Kimura, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Japan

Filed May 7, 1984, Ser. No. 607,615
Claims priority, application Japan, May 10, 1983, 58-82058
Int. Cl.[4] D01H *15/00*
U.S. Cl. 57—22 **11 Claims**

1. A yarn splicing device for splicing spun yarns to each other wherein end sections of two yarns are placed in overlapping relationship one on the other and thus overlapping portions of the yarns are acted upon by fluid to effect intended splicing of the yarns, characterized in that an untwisting nozzle for sucking yarn end sections and for untwisting the yarn end sections by an action of a flow of the fluid comprises a nozzle pipe, a fluid injecting hole formed to open to an inner circumferential face of the nozzle pipe, and an intercepting plate disposed within the nozzle pipe, said intercepting plate being



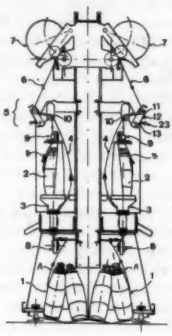
so constructed that a turbulent flow is produced in the nozzle pipe when the fluid is jetted from the fluid injecting hole.

4,549,393

MACHINE FOR CABLING YARNS AND IN PARTICULAR GLASS YARNS

Carlos Matas Gabalda, Granges les Valence, France, assignor to Asa S.A., Villeurbanne, France

Filed Jan. 11, 1984, Ser. No. 569,905
Claims priority, application France, Jan. 20, 1983, 83 01041
Int. Cl.[4] D02G *3/28, 3/38, 3/00;* **D01H** *7/00*
U.S. Cl. 57—58.36 **5 Claims**



1. A yarn cabling machine for twisting two strands together into a cabled yarn and winding said cabled yarn, said cabling machine comprising:

a supply source for each strand, a first one of said supply sources being located downstream of a second one of said supply sources in a direction of strand travel;

means for tensioning each strand located downstream of each supply source, a first tensioning means being located between said first and second supply sources, and a second tensioning means being located downstream of said first supply source; and

means for twisting said strands together into said cabled yarn, said twisting means being located downstream of said second tensioning means and including

roller means rotatably mounted on an axis of said second supply source downstream of said second tensioning means, said strands contacting a portion of the peripheral surface of said roller means and being twisted together thereon; and

compensating means for adjusting tension in the cabled yarn to maintain said tension substantially constant, said compensating means including means for deactivating said yarn cabling machine upon rupture of at least one of said strands.

4,549,394

STRANDING DEVICE FOR STRANDING MACHINES, PARTICULARLY A PRE-TWIST AND DRAFTING DEVICE

Theodor Preussner, Ermlandstrasse 92E, D-3004 Isernhagen 2, Fed. Rep. of Germany

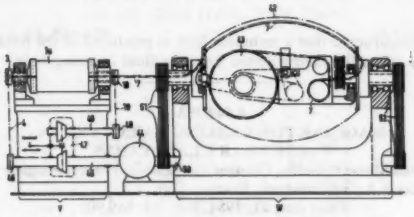
PCT No. PCT/EP83/00070, § 371 Date Oct. 20, 1983, § 102(e) Date Oct. 20, 1983, PCT Pub. No. WO83/03268, PCT Pub. Date Sep. 29, 1983

PCT Filed Mar. 9, 1983, Ser. No. 557,137

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1982, 3209169; Jul. 16, 1982, 3226572

Int. Cl.[4] D07B *3/10*

U.S. Cl. 57—58.57 24 Claims



1. A stranding device for stranding machines, particularly a pre-twist and drafting device as an advance ancillary device for single or multiple rope-lay machines, the stranding device comprising a driven rotor support frame rotatable about a longitudinal axis of rotation and having a stranding entry station; a driven drafting wheel mounted on said rotor support frame and rotatable about a transverse axis which is transverse to said longitudinal axis of said driven rotor support frame, so that a wire rope component is supplied at said stranding entry station substantially along said longitudinal axis of said rotor support frame, is guided at said rotor support frame to said drafting wheel, passes around said drafting wheel, and then is guided along said longitudinal axis from said rotor support frame; a rotary member rotatable in a direction which is opposite to the direction of rotation of said drafting wheel about said transverse axis coaxially with said drafting wheel; components rotatable with said drafting wheel; components rotatable with said rotary member, the shape, dimensions, masses and/or velocities of rotation of said drafting wheel and said rotary member, as well as said components rotating with them, being selected so that a product of the mass moment of inertia and an angular velocity of said drafting wheel with its components and said rotary member with its components rotating in opposite directions are at least approximately uniform in magnitude; a common axle defining said transverse axis of rotation of said drafting wheel and said rotary member, said drafting wheel and said rotary member having each an associated hollow shaft and said hollow shafts being rotatably mounted and supported on said common axle against centrifugal forces directed toward said rotor support frame, and a product of the total mass of said components rotating together with said drafting wheel and a distance of their common centre of mass from said longitudinal axis of said rotor support frame being at least approximately equal to the product of the total mass of said components rotating together with said rotary member and the distance of their common centre of mass from said longitudinal axis of said rotor support frame.

22. A stranding machine, comprising a stranding device formed as a pre-twist and drafting device and including a driven rotor support frame rotatable about a longitudinal axis of rotation and having a stranding entry station, a drafting wheel mounted on said rotor support frame and rotatable about a transverse axis which is transverse to said longitudinal axis of said driven rotor support frame, so that a wire rope component is supplied at said stranding entry station substantially along said longitudinal axis of said rotor support frame, is guided at said rotor support frame to said drafting wheel, passes around said drafting wheel, and then is guided along said longitudinal axis from said rotor support frame, a rotary member rotatable in a direction which is opposite to the direction of rotation of said drafting wheel about said transverse axis coaxially with said drafting wheel, components rotatable with said driven drafting wheel, components rotatable with said rotary member, the shape, dimensions, masses and/or velocities of rotation of said drafting wheel and said rotary member, as well as said components rotating with them, being selected so that a product of the mass moment of inertia and an angular velocity of said drafting wheel with its components and said rotary member with its components rotating in opposite directions are at least approximately uniform in magnitude, a common axle defining said transverse axis of rotation of said drafting wheel and said rotary member, said drafting wheel and said rotary member having each an associated hollow shaft and said hollow shafts being rotatably mounted and supported on said common axle against centrifugal forces directed toward said rotor support frame, and a product of the total mass of said components rotating together with said drafting wheel and a distance of their common centre of mass from said longitudinal axis of said rotor support frame being at least approximately equal to the product of the total mass of said components rotating together with said rotary member and the distance of their common centre of mass from said longitudinal axis of said rotor support frame; a winding device for the wire rope including a rotor member rotating coaxial with said rotor support frame about said longitudinal axis and arranged so that the wire rope from said rotor support frame of said stranding device is guided at said rotor member along said longitudinal axis, and a winding drum orbited by said rotor member; a first rotary drive for said rotor support frame of said stranding device; a second rotary drive for said drafting wheel of said stranding device; a third rotary drive for said rotor member of said winding device; and a common main driving motor with mechanical driving means connecting continuously said common main driving motor with said first, second and third rotary drives.

4,549,395

YARN FALSE TWISTING METHOD AND APPARATUS

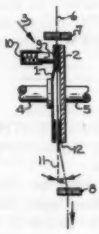
Peter Dammann, Remscheid, Fed. Rep. of Germany, assignor to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Filed Feb. 24, 1984, Ser. No. 583,157

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1983, 3306580

Int. Cl.[4] D02G *1/08*

U.S. Cl. 57—340 15 Claims



1. A method of false twisting yarn which comprises the steps of

operatively rotating a pair of twist imparting members, with each member including a yarn engaging friction surface, and at least one of said members comprising a circular disc, and such that portions of the respective yarn engaging friction surfaces are disposed in opposing, fact-to-face

relationship and define a twisting zone therebetween, while

advancing a yarn through said twisting zone so that twist is imparted thereto by the frictional contact between the yarn and the respective opposed friction surfaces, and including laterally deflecting the advancing yarn at a point downstream of said disc and in a direction generally perpendicular to the plane defined by the yarn engaging friction surface of said disc, and so as to form an angle of between about 3 to 15 degrees with respect to such plane, and such that the yarn is brought into frictional contact with the peripheral edge of said disc at a point on the side of said disc generally opposite twisting zone, to thereby impart twist to the yarn in a direction opposite to that imparted at said twisting zone.

7. A yarn false twisting apparatus comprising a pair of twist imparting members, one of said members comprising a circular disc having a yarn engaging friction surface on one face thereof, and the other of said members having a yarn engaging friction surface,

means mounting said members for rotational movement wherein portions of the respective yarn engaging friction surfaces are disposed in opposing, face-to-face relationship and define a twisting zone therebetween,

means for rotating said members such that their respective yarn engaging friction surfaces run in different directions through said twisting zone, and

means for guiding an advancing yarn through said twisting zone so as to have twist imparted thereto at said twisting zone by frictional contact between the yarn and the respective opposed friction surfaces, and including yarn guide means positioned downstream of said disc for laterally deflecting the advancing yarn at an angle of between about 3 to 15 degrees with respect to the plane defined by the yarn engaging friction surface of said circular disc, and so that the yarn is brought into frictional contact with the peripheral edge of said disc at a point on the side of said disc generally opposite said twisting zone, to thereby impart twist to the yarn in a direction opposite to that imparted at said twisting zone.

4,549,396

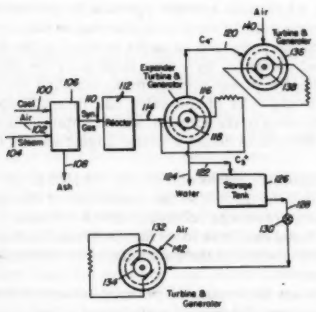
CONVERSION OF COAL TO ELECTRICITY

William E. Garwood, Haddonfield; James C. Kuo; Solomon M. Jacob, both of Cherry Hill, all of N.J., and John J. Wise, Westport, Conn., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 80,819, Oct. 1, 1979, abandoned, which is a continuation-in-part of Ser. No. 951,100, Oct. 13, 1978, abandoned, which is a continuation-in-part of Ser. No. 602,860, Aug. 6, 1975, abandoned. This application Jan. 18, 1982, Ser. No. 339,962

Int. Cl.⁴ F02B *43/08*

U.S. Cl. 60—39.02 **20 Claims**



1. In the conversion of coal to electricity by the gasification of said coal to a combustible synthesis gas and the combustion of said gas in an electricity generating mode to thereby produce electricity; the improvement which comprises conducting said gasification of coal with air to a combustible synthesis gas comprising carbon monoxide, hydrogen and nitrogen and contacting said combustible gas with a composite catalyst comprising a carbon monoxide reducing metal species component and a hydrocarbon converting crystalline aluminosilicate zeolite component having a high silica to alumina ratio of at least about 15, a constraint index of 1 to 12 and a crystal density of not substantially below about 1.6 grams per cubic centimeter, wherein the weight ratio of said zeolite to said metal species is in the approximate range of between about 0.2/1 and about 5/1, at temperatures of about 450° to 850° F., space velocity of about 0.5 to 10 WHSV and pressures up to about 1000 psig sufficient to convert said combustion synthesis gas to a product comprising a normally liquid fraction comprising C_5 to C_{11} hydrocarbon compounds and a gas fraction comprising C_4- hydrocarbons; continuously burning said C_4- gas in an electricity generating mode; accumulating and storing said normally liquid fraction in the liquid state; and intermittently burning said stored normally liquid fraction in an electricity generating mode.

20. The improved process claimed in claim 1 wherein said burning of said stored normally liquid fraction in an electricity generating mode occurs in a direct fired turbine coupled to an electricity generator.

4,549,397

CONTROL SYSTEM FOR CHENG DUAL-FLUID CYCLE ENGINE SYSTEM

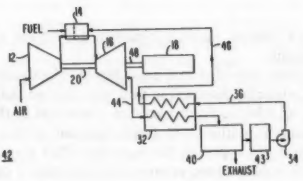
Dah Y. Cheng, Los Altos Hills, Calif., assignor to International Power Technology, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 273,269, Jun. 12, 1981, Pat. No. 4,417,438. This application Mar. 18, 1983, Ser. No. 476,456

The portion of the term of this patent subsequent to Feb. 3, 1998, has been disclaimed.

Int. Cl.⁴ F02C *7/00*

U.S. Cl. 60—39.3 **4 Claims**



1. In a dual-fluid heat engine, which can be operated to produce co-generated process steam having:

a chamber;

compressor means for introducing a first gaseous working fluid comprising air into said chamber, said compressor means having a predetermined pressure ratio (CPR);

means for introducing a second liquid-vapor working fluid comprising water in the form of a vapor within said chamber at a defined water/air working fluid ratio (XMIX);

means for heating said water vapor and air in said chamber at a defined specific heat input rate (SHIR);

turbine means responsive to the mixture of said first and second working fluids for converting the energy associated with the mixture to mechanical energy, the temperature of said mixture entering said turbine means defining the turbine inlet temperature (TIT) and having a design maximum turbine inlet temperature (TITmax);

counterflow heat exchanger means for transferring residual thermal energy from said exhausted mixture of first and second working fluids to said incoming working fluid water to thereby preheat the same to water vapor prior to its introduction within said chamber;

means for diverting water vapor from said chamber, if desired, for co-generated processed steam; and wherein the improvement comprises:

means for operating the engine under partial load conditions such that when no co-generated process steam is required, the engine control path follows a locus of peak efficiency points resulting in declining TIT as the load decreases, and such that XMIX and SHIR are selected so that for a given value of TIT, XMIX is substantially equal to or is greater than XMIX peak, where XMIX peak occurs when the following conditions are both met simultaneously:

(i) the temperature of the water vapor is substantially maximized; and

(ii) the effective temperature of said exhausted mixture of the first and second working fluids is substantially minimized; and

means for operating the engine to produce co-generated process steam by following a control path which reduces the steam flow rate to said chamber as process steam increases.

4,549,398

EXHAUST GAS CLEANING DEVICE FOR DIESEL ENGINES

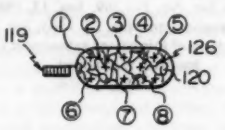
Kiyohiko Oishi, Susono; Kiyoshi Kobashi, and Kenichirou Takama, both of Mishima, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Feb. 10, 1982, Ser. No. 347,424

Claims priority, application Japan, Jun. 22, 1981, 56-95215; Jun. 22, 1981, 56-95216

Int. Cl.⁴ F01N *3/02*

U.S. Cl. 60—286 **3 Claims**



1. An exhaust particle cleaning device for a diesel engine comprising:

a trap case provided in a passageway of exhaust gas;

a filter material disposed in said trap case so that carbon particles or other exhaust particles contained in the exhaust can be caught within said filter material during the time the exhaust gas is passed through said filter material;

a plurality of ceramic heater elements spread or dispersed on the upstream end face of said filter material, so that the exhaust gas passes through the areas between said plurality of ceramic heater elements;

each of said ceramic heater elements being formed in the shape of a cross and being arranged so that the shape of the cross is seen from the direction of the exhaust gas flow;

each of said ceramic heater elements comprising an electric filament or the like coated with a ceramic material; and

means for electrically controlling said plurality of heater elements.

4,549,399

EXHAUST EMISSION CONTROL SYSTEM FOR DIESEL ENGINE

Toshifumi Usui, Katsuta, and Syozo Yanagisawa, Ibaraki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 23, 1984, Ser. No. 573,138

Claims priority, application Japan, Jan. 24, 1983, 58-8654; Mar. 7, 1983, 58-36020

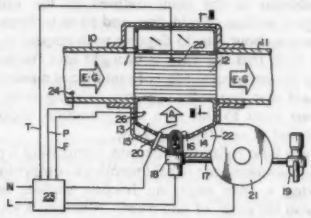
Int. Cl.⁴ F01N *3/02*

U.S. Cl. 60—286 **5 Claims**

1. An exhaust emission control system for a diesel engine comprising:

a trap having no directionality with respect to air permeability;

means for introducing and directing air against said trap in a direction substantially perpendicular to a direction in which an exhaust gas flows from the engine to the trap; and



a fuel injection nozzle opening in a path of flow of the air introduced by said introducing and directing means;

wherein a fuel is supplied to said fuel injection nozzle to control the conditions under which said trap is subjected to an oxidation treatment so as to oxidize particulates of carbon caught by the trap to achieve regeneration of the trap.

4,549,400

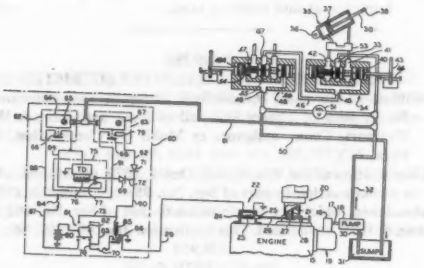
ELECTRO-HYDRAULIC ENGINE THROTTLE CONTROL

Alex C. King, 1160 Kellogg, Green Bay, Wis. 54303

Continuation-in-part of Ser. No. 369,446, Apr. 19, 1982, abandoned. This application Apr. 13, 1984, Ser. No. 599,961

Int. Cl.⁴ F15B *21/10*

U.S. Cl. 60—394 **14 Claims**



12. In apparatus including an internal combustion engine having a throttle settable to control its speed, a pump driven by the engine, a hydraulic actuator operable by pressurized fluid from the pump, control valve means having an inlet coupled to the outlet of the pump and an outlet coupled to the hydraulic actuator and means for bypassing fluid from the inlet to the outlet, an electric power source, means coupling the outlet of the pump to the inlet of the valve and means coupling the outlet of the valve to the actuator, and an improved system for setting the throttle to obtain alternate engine speeds, comprising:

electroresponsive means operatively coupled to the throttle for setting the throttle so the engine runs at idle speed and the pump produces relatively lower pressure and said means being operative to set the throttle so the engine runs at higher speed and the pump produces relatively higher pressure;

sensing means for sensing the pressure between the outlet of the pump and the inlet of said control valve;

first switch means responding to a pressure increase above a

predetermined lower level being sensed, as a result of opening said control valve to provide pressurized fluid to said actuator and concurrently closing said bypass by operating said electroresponsive means with electric power from said source to thereby set said throttle for the engine to run at a higher speed and for the pump to produce higher pressure;

second switch means responsive to said higher pressure being sensed by maintaining operation of said electroresponsive means with power from said source;

said second switch means responding to a pressure drop below said higher pressure as a result of closing said valve and opening said bypass by terminating operation of said electroresponsive means; and

time delay means operative to disable said first switch means from operating said electroresponsive means until the pressure has dropped below said lower pressure level after said valve is closed and said bypass is opened again.

4,549,401

METHOD AND APPARATUS FOR REDUCING THE INITIAL START-UP AND SUBSEQUENT STABILIZATION PERIOD LOSSES, FOR INCREASING THE USABLE POWER AND FOR IMPROVING THE CONTROLLABILITY OF A THERMAL POWER PLANT

Heinz Spliethoff, Friedrichsthal, Fed. Rep. of Germany, assignor to Saarbergwerke Aktiengesellschaft, Saarbrücken, Fed. Rep. of Germany

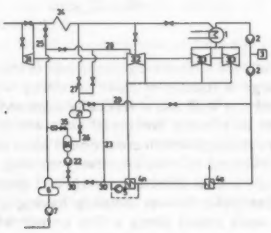
PCT No. PCT/EP81/00204, § 371 Date May 13, 1983, § 102(e) Date May 13, 1983, PCT Pub. No. WO83/01090, PCT Pub. Date Mar. 31, 1983

PCT Filed Dec. 23, 1981, Ser. No. 494,765

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1981, 3137371

Int. Cl.[4] F01K *3/00*

U.S. Cl. 60—652 **3 Claims**



1. An apparatus for use in a thermal power plant water vapor circuit associated with a steam generator and having a steam side and a water side, said apparatus being operable to reduce start-up and shutdown losses, to increase usable power from the plant and to improve control of the plant, said apparatus comprising pressure heat accumulator means connected to the steam side whereby start-up steam, shutdown steam and excess steam may be introduced to the pressure accumulator means, said apparatus being characterized by connection of the pressure heat accumulator means to the water side at a point after the water passes through feedwater preheater means, and by connection from the pressure heat accumulator means to a feedwater tank; with depressurizer means in circuit between the pressure heat accumulator means and the steam connection to the feedwater tank.

4,549,402

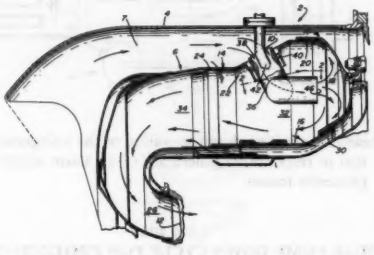
COMBUSTOR FOR A GAS TURBINE ENGINE

John A. Saintsbury, Hemmingford; Parthasarathy Sampath, Mississauga, and Maurice Weinberg, Willowdale, all of Canada, assignors to Pratt & Whitney Aircraft of Canada Limited, Longueuil, Canada

Continuation of Ser. No. 382,416, May 26, 1982, abandoned. This application Sep. 17, 1984, Ser. No. 650,992

Int. Cl.[4] F02C *7/22*

U.S. Cl. 60—738 **4 Claims**



1. A combustor in a gas turbine engine of the type including a reverse flow annular combustor, the combustor having an inner cylindrical wall, an outer wall concentric with the inner wall about a combustor axis, and an annular dome connecting the inner wall and outer wall, the outer wall having a first cylindrical wall portion adjacent the dome and having a predetermined diameter, a second outer wall portion adjacent the first wall portion and remote from the dome, the second wall portion terminating in a third wall portion of cylindrical shape and of reduced diameter compared to the diameter of the first wall portion such that the second outer wall portion is frustoconical; the dome, first and second outer wall portions define the primary combustion zone, and the third outer wall portion defines the secondary zone, the engine including a casing surrounding the reverse flow combustor and defining an annular air passage for compressor delivered air with the outer wall of the combustor; fuel injector means disposed on the second wall portion, and directed towards the dome, compressor delivered air intake means adjacent said fuel injector means, the cross-sectional area of the annular air passage at the first wall portion being less than the cross-sectional area of the annular passage at said third wall portion thereby creating a pressure head such that compressor delivered air is directly injected into the primary zone with the fuel by virtue of intake means being provided adjacent the fuel injector means.

4,549,403

METHOD AND CONTROL SYSTEM FOR PROTECTING AN EVAPORATOR IN A REFRIGERATION SYSTEM AGAINST FREEZEUPS

Richard G. Lord, Liverpool, and Kenneth J. Nieva, Mattydale, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 6, 1984, Ser. No. 597,332

Int. Cl.[4] F25D *17/02*

U.S. Cl. 62—201 **4 Claims**

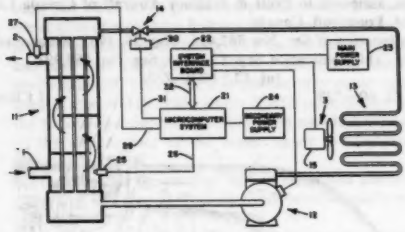
4. A control system for a refrigeration system having an evaporator for cooling a heat transfer fluid passed through the evaporator, comprising:

first sensor means for sensing the temperature of the heat transfer fluid in the evaporator and for generating a first signal indicative of this sensed temperature;

second sensor means for sensing the temperature of the heat transfer fluid leaving the evaporator and for providing a second signal indicative of this sensed temperature;

processor means for receiving the first and second signals from the first sensor means and second sensor means, respectively, for processing the first and second signals

and for generating an alarm signal when the temperature of the first signal is less than the second signal by a preselected amount; and



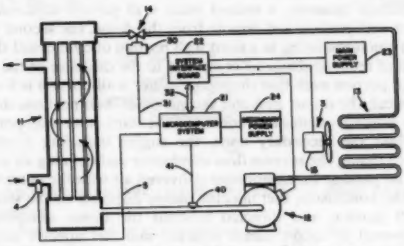
means for shutting down operation of the refrigeration system in response to generation of an alarm signal by the processor means.

4,549,404

DUAL PUMP DOWN CYCLE FOR PROTECTING A COMPRESSOR IN A REFRIGERATION SYSTEM

Richard G. Lord, Liverpool, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 9, 1984, Ser. No. 597,947
Int. Cl.[4] F25B *41/04*
U.S. Cl. 62—224 **2 Claims**



1. A method of operating a refrigeration system including a compressor for compressing gaseous refrigerant supplied to the compressor from an evaporator and including an expansion valve for controlling refrigerant flow from a condenser to the evaporator, comprising:

driving the expansion valve to a fully closed position to substantially prevent refrigerant flow from the condenser to the evaporator whenever the refrigeration system is shut down;

running the refrigeration system compressor for a first preselected amount of time sufficient to reduce the refrigerant pressure in the evaporator to a first desired level after the expansion valve is driven to its fully closed position by the step of driving; and

running the refrigeration system compressor for a second preselected amount of time sufficient to reduce the refrigerant pressure in the evaporator to a second desired level while maintaining the expansion valve in its fully closed position prior to restarting the refrigeration system after a shut down.

2. A control system for operating a refrigeration system including a compressor for compressing gaseous refrigerant supplied to the compressor from an evaporator which receives refrigerant from a condenser, comprising:

an expansion valve for controlling refrigerant flow from the condenser to the evaporator, said expansion valve having a fully closed position which substantially prevents refrigerant flow from the condenser to the evaporator; and

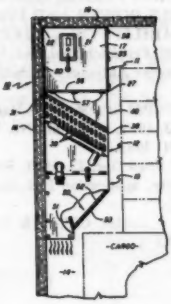
a control means for turning the refrigeration system off and on, for moving the expansion valve to its fully closed position whenever the refrigeration system is turned off, for generating and supplying a first control signal to the refrigeration system compressor to run the compressor for a first preselected time period sufficient to reduce refrigerant pressure in the evaporator to a first desired level whenever the refrigeration system is turned off and the expansion valve is moved to its fully closed position by said control means, and for generating and supplying a second control signal to the refrigeration system compressor to run the compressor, while maintaining the expansion valve in its fully closed position, for a second preselected time period sufficient to reduce the refrigerant pressure in the evaporator to a second desired level prior to said control means turning on the refrigeration system.

4,549,405

MODULAR AIR CONDITIONING UNIT FOR MOBILE CARGO CONTAINER

Gordon K. Anderson, Tustin, and William S. Savage, LaMirada, both of Calif., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 12, 1983, Ser. No. 560,719
Int. Cl.[4] B60H *3/04*
U.S. Cl. 62—239 **4 Claims**



1. In an enclosed mobile cargo container of rectangular form in which cargo is stacked in close proximity with a horizontally disposed top wall and a vertically disposed front wall of the container to provide horizontal and vertical air passages therebetween through which conditioned air is moved, a modular air conditioning unit for selectively moving air in either a horizontal or vertical direction along said passages that includes a rectangular blower housing having a first pair of closed side walls joined along a first corner which complements the top front corner of a cargo container, and a second pair of open side walls forming a second corner, said open side walls including an entrance wall for admitting air into the housing and an exit wall for discharging air from the housing, a motor driven blower mounted within the housing for drawing air into the housing through the entrance wall and discharging the air through the exit wall, hanger means for interchangeably mounting the housing in the top front corner of the container with the closed walls seated against the top and front container walls whereby the exit wall can be vertically positioned to direct discharge air downwardly adjacent to the front wall of the container or horizontally positioned to direct discharge air rearwardly adjacent to the top wall of the container, an evaporator cabinet containing an evaporator coil, said cabinet including a straight duct having opposed open ends whereby air passing therethrough moves over said coil, fastener means for interchangeably attaching either end of the

cabinet to either of the open walls of the housing whereby the blower housing can be operatively connected to the evaporator cabinet to either blow or draw air through the cabinet and the cabinet and housing can be selectively mounted in the top front corner of the container to direct air either along the top wall or the bottom wall of the container, a hollow air duct that is removably attached to one end of the evaporator cabinet which contains a drain means therein for collecting condensate from the evaporator coil and carrying it out of the duct when the cabinet is suspended in a vertical position along the front wall of the container.

4,549,406

COOLING DEVICE FOR VEHICLE INTERIORS

Anneliese Ebner, and Erwin Kranauer, both of Rennstallweg 41, 39012 Meran, Italy

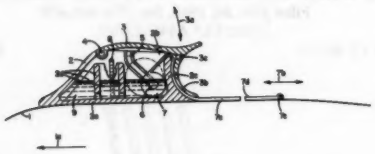
PCT No. PCT/EP83/00282, § 371 Date Jun. 19, 1984, § 102(e) Date Jun. 19, 1984, PCT Pub. No. WO84/01749, PCT Pub. Date May 10, 1984

PCT Filed Oct. 28, 1983, Ser. No. 624,664

Claims priority, application Italy, Oct. 28, 1982, 4849 A/82

Int. Cl.[4] B60H *3/04*

U.S. Cl. 62—241 **20 Claims**



1. A device for cooling an interior of a vehicle having an exterior wall and adapted for travelling in a travel direction, comprising:

a container (2) which is elongated in a direction transversely to the travel direction and which has a bottom (2*a*) adapted to closely engage on the exterior wall of the vehicle, said container defining an interior space for containing an evaporateable liquid (9) up to a selected level in said space, said container including a rear rib-like wall (2*c*) extending upwardly from said bottom and above said selected level; and

a mat (7*a*) of liquid absorbent material for absorbing evaporateable liquid in said container, said mat having a first portion disposed in said container below said selected level and a second portion (7*a*) extending over said rear wall and along an outer surface of said rear wall down to a level of said bottom (2*a*), said mat second portion (7*a*) adapted to extend along the vehicle wall behind said container (2) in the travel direction whereby evaporateable liquid is provided to said second portion of said mat by capillary action.

4,549,407

EVAPORATIVE COOLING

Peter A. Gruber, Mohegan Lake, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 6, 1984, Ser. No. 597,306

Int. Cl.[4] F28D *5/00*

U.S. Cl. 62—304 **7 Claims**

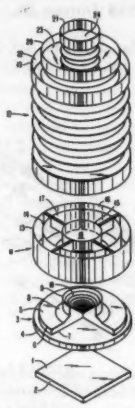
1. Evaporative cooling apparatus comprising in combination

a liquid delivery conduit extending from a heat transfer location to a region remote therefrom,

a gas delivery conduit concentric with said liquid delivery conduit extending from said heat transfer location to a region remote therefrom,

means for forming droplets of said liquid in the immediate vicinity of said heat transfer location,

means for mixing said gas and said droplets for evaporation adjacent said heat transfer location, and



exhaust means concentric with said liquid delivery conduit and said gas delivery conduit for removal of the combination said gas and said evaporated liquid.

4,549,408

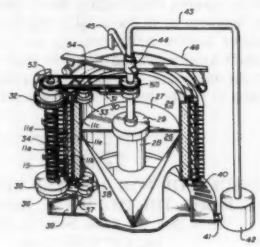
CUBE ICEMAKER WITH ROTARY ICE REMOVER MEANS

Joseph M. Lee, 11223 Bonaport, Cypress, Tex. 77429, and Robert C. Lane, 2030 Richmond, Houston, Tex. 77098

Filed Jun. 8, 1984, Ser. No. 618,687

Int. Cl.[4] F25C *5/02*

U.S. Cl. 62—320 **13 Claims**



1. An ice maker for automatically and continuously producing clear in cubes, comprising:

(a) a vertically disposed, stationary evaporator drum, the exterior surface of said evaporator drum including a plurality of radially outwardly projecting ridges, said exterior surface being chilled to a freezing temperature;

(b) a rotary, perforated water distribution tube overlying the outer circumferential surface of said evaporator drum for delivering a continuous and predetermined amount of water to said exterior surface so as to form a layer of ice thereupon;

(c) a water pump for supplying water to said rotary, perforated water distribution tube; and,

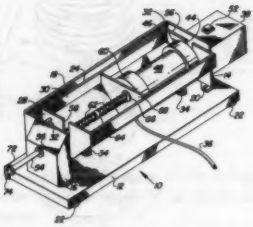
(d) a rotary, sequentially functioning, cutter asssembly coacting with said rotary, perforated water distribution tube, said cutter assembly including a plurality of cube sizer bits which act to continuously and sequentially break, size and remove cubes from said layer of ice formed on said exterior freezing surface of said evaporator drum.

4,549,409

APPARATUS FOR COOLING BEVERAGE CONTAINERS AND THE LIKE

Jeffrey I. Smith, 5018 Dittmer St., #259, Davenport, Iowa 52804

Filed Mar. 21, 1985, Ser. No. 714,657
Int. Cl.[4] F25D *25/02*
U.S. Cl. 62—381 **7 Claims**



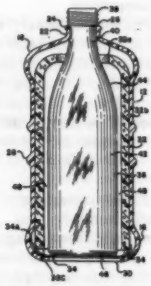
1. Apparatus for cooling essentially cylindrical articles such as beverage cans and bottles, comprising supporting structure including an elongated horizontal base having first and second longitudinally spaced apart first and second supports fixed to and rising therefrom, a horizontally extending, ice-receivable, open-topped receptacle extending between and having first and second ends respectively inwardly of and adjacent to the supports, means mounting the receptacle on the supporting structure, a first horizontal shaft journaled in the first support and extending rotatably into the receptacle via the first end of the receptacle, an article-receiving member fixed to the shaft within the receptacle, a second horizontal shaft coaxial with the first shaft and journaled and axially slidably carried in the second support and extending into the receptacle via the second end of the receptacle to a terminal end short of the first article-receiving member, a second article-receiving member fixed to the terminal end of the second shaft, said members respectively having confronting faces configured to receive coaxially between them the axially opposite ends of an article to be rotated within the receptacle, spring means biasing the second shaft axially toward the first shaft to grip the article between the members, and means for rotating the first shaft and thereby to rotate the article and second shaft and its member.

4,549,410

INSULATOR FOR BOTTLED BEVERAGES

William C. Russell, TDL P.O. Box 28, Denton, Tex. 76201

Filed Dec. 21, 1984, Ser. No. 684,951
Int. Cl.[4] F25D *3/08*
U.S. Cl. 62—457 **5 Claims**



1. A refrigerant-free insulator and holder for beverages carried in containers having a neck ring comprising:

(a) a semi-rigid outer shell, the shell having a top opening to receive the container neck ring, the top opening having inner dimensions slightly smaller than the outer dimensions of the neck ring, the shell also having a bottom opening to receive the container, the bottom opening having inner dimensions slightly larger than the outer dimensions of the container body;

(b) an inner insulating sleeve carried within the shell; and,

(c) means for supporting the bottom periphery of the container, the support means being carried within the shell and surrounding the bottom opening of the shell, the support means flexing to a position permitting insertion and removal of the container from within the shell and thereafter returning to a support position,

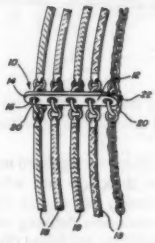
such that when a container is admitted into the shell through the bottom opening the neck ring of the container causes the top opening to expand to permit passage of the neck ring, thereafter the top opening contracts underneath the neck ring, the contracted top opening and support means in the support position holding the container within the shell.

4,549,411

JEWELRY CHAIN ORGANIZER

Alma T. Ivey, 7309 McCormack Dr., Hixson, Tenn. 37343

Filed Feb. 24, 1983, Ser. No. 469,400
Int. Cl.[4] A44C *25/00*
U.S. Cl. 63—2 **1 Claim**



1. In combination, a plurality of flexible jewelry chains adapted to be oriented in encircling relation to the neck, wrist, arm or the like of a wearer, each chain including an openable fastener detechably connecting the ends of the chain together, said chains being free of each other and having a length rendering them sufficiently loose in their embrace of the member they are intended to encircle so that the chains have a tendency to become entangled by intertwining and the fasteners have a tendency to become remotely spaced from one another about the member by moving in linear relation to each other, an organizer for maintaining the plurality of said jewelry chains in predetermined relationship with the fasteners in adjacent, generally aligned relation, said organizer comprising an elongated body having means incorporated therein releasably connected with all of the plurality of jewelry chains without modifying the capability for independent use of such chains and without modifying the structural characteristics thereof, said means connected with the jewelry chains reducing the tendency of the chains to become entangled by intertwining and preventing such misalignment and remote spacing of the fasteners by preventing relative linear movement of the chains by preventing displacement of the portions of the chains connected with the organizer, said elongated body including a generally thin, narrow, flat plate extending generally transversely to said plurality of chains, said means connected with the chains and maintaining the relationship thereof including a plurality of apertures in the plate, each of the chain fasteners including an openable split ring directly joining end links of its associated chain through a respective one of the apertures, said apertures being spaced along the longitudinal center line of the

plate to retain the split rings in aligned spaced relation, said plate including parallel side edges and rounded ends and being constructed as a decorative and ornamental jewelry item.

4,549,412

FABRIC TAKE-DOWN DEVICE FOR KNITTING MACHINES

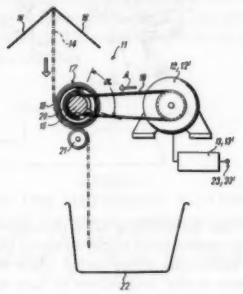
Thomas Stoll, Reutlingen; Jürgen Ploppa, Pfullingen, and Ernst Goller, Reutlingen, all of Fed. Rep. of Germany, assignors to Stoll GmbH and Company, Fed. Rep. of Germany

Filed Jan. 19, 1984, Ser. No. 572,025

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1983, 3302523; Dec. 23, 1983, 3346743

Int. Cl.[4] D04B *15/88*

U.S. Cl. 66—149 R **11 Claims**



1. A fabric take-down mechanism for a knitting machine, comprising a take-down component, a motor operative to drive said take-down component, said motor producing an output torque, and a torque-adjusting device operative to adjust said output torque of said motor to control said take-down component, said torque-adjusting device including a motor regulating system having control inputs, transmitting means operative to transmit to said control inputs a target torque figure and at least one instant torque value from said motor, and further inputs for receiving an electrical shift pulse to vary said output torque.

4,549,413

DEVICE FOR THE PHOTOELECTRIC SUPERVISION OF A WARP LOOM

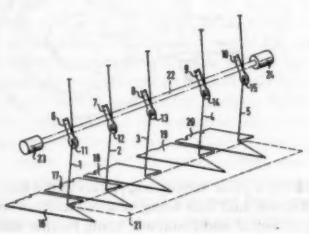
Peter Flämig, Munich, Fed. Rep. of Germany, assignor to Protechna Herbst GmbH & Co. KG, Ottobrunn, Fed. Rep. of Germany

Filed Sep. 21, 1984, Ser. No. 653,948

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1983, 3335656

Int. Cl.[4] D04B *35/12*

U.S. Cl. 66—163 **26 Claims**



1. Device for the photoelectric monitoring of a wrap loom for irregularities in the yarn supply of a yarn sheet, comprising: an infrared radiation source for producing a beam passing to the eye needles in a plane parallel to said yarn sheet in the area of the yarn supply; an infrared radiation receiver for generating a signal depending on the intensity of said beam; evaluation circuit means for processing said signal; and a display means for responding to a control signal characterising irregularity of said yarn supply and/or a switch device for driving said warp machine, wherein the infrared source and the associated receiver are arranged so that said beam is alternately at least partially interrupted and released in synchronism with the frequency of knitting tool and/or guide bar oscillation by means of the knitting tools and the yarns processed thereby in the reversing positions of said knitting tools, and wherein a periodic monitoring signal sequence thus generated by the infrared receiver is periodically processed in said evaluation circuit by a window or gating circuit means only during a preset gating time period within each beam release phase, so that only the signal values produced in each window pulse gating phase are compared in a comparator means with a comparison value.

4,549,414

KNITTING MACHINE TO PRODUCE FIGURED FABRICS

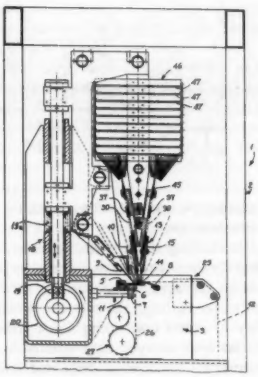
Luigi O. Zorini, Cilavegna, and Walter Zorzoli, Vigevano; both of Italy, assignors to Comez S.p.A., Cilavegna, Italy

Filed Aug. 15, 1983, Ser. No. 523,122

Claims priority, application Italy, Oct. 21, 1982, 23856 A/82

Int. Cl.[4] D04B *27/10*

U.S. Cl. 66—203 **17 Claims**



1. An improved knitting machine for the production of figured fabrics, that is, having different colors and patterns, of the kind associated with a crochet-machine and a jacquard device on a sole bearing frame and comprising:

active members such as a needle-bar movable in an axial direction to the needles, a warp yarn guide bar disposed adjacent the needles and suitable to oscillate in a direction parallel to the lying plane of the needles and to rotate perpendicularly to the same plane, an under-yarn guide bar suitable to oscillate in a direction parallel to the needle plane and perpendicularly to the same, a projection carrier bar movable at right angles to the needle plane, rods suitable to support tubular weft yarn guides disposed side by side on plates parallel to said needle bar and transversely to the needle plane, said plates being movable along their own plane and parallelly to said needle bar in order to define the working oscillations of said rods;

selection and control members for said active members designed to cause the same active members to intervene according to a predetermined program;

feeding devices for the yarns forming the fabric; and

conveying means for the produced fabric; characterized in that

said rods are rotatably supported by pivot pins extending at right angles to said plates, as well as stop members for oscillations of said rods, adapted to allow the rods to oscillate symmetrically with respect to vertical planes and to cause the maximal linear amplitudes of said tubular weft yarn guides which correspond to the double distance of two needles in succession, and in that

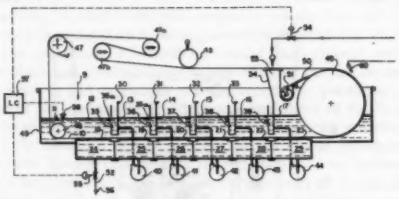
said selection and control members include a plurality of kinematic chains suitable to position each of said rods angularly and independently of the adjacent rods.

4,549,415

CONTINUOUS COUNTERFLOW BELT WASHER

Edgar J. Justus, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Feb. 3, 1983, Ser. No. 463,620
Int. Cl.⁴ D21C *9/00, 9/02*
U.S. Cl. 68—158 **4 Claims**



1. A continuous wood pulp fiber washing mechanism comprising in combination:

a vat for containing stock washing water;

a traveling foraminous wire positioned to pass submerged in the vat for collecting fibers on the surface with the passage of water through the wires to wash the fibers;

a plurality of liquid containing stock chambers in the vat above the wire arrayed sequentially in the direction of wire travel for containing stock and immersing the wire and stock above the wire with a first chamber at the upstream end of the wire relative to its direction of travel and sequential chambers positioned after said chamber, the fibers being collected on the upper surface of the wire freely exposed to the water in said chambers;

baffles between each of the chambers affording controlled communication at the lower edge of the baffles between adjacent chambers;

stock delivery means for delivering stock to said first chamber;

a foraminous plate means beneath the wire;

pump means for each of the chambers drawing water through the wire beneath the plate and delivering the withdrawn water to the next sequential chamber upstream below the level of liquid in said chamber;

supply compartments having uniform fluid distributors feeding to each of the chambers and being mounted adjacent the baffles with said pump means delivering water to the next sequential chamber through said compartment; and

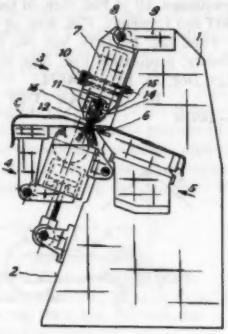
means for removing washed pulp fibers from the wire surface following the chambers.

4,549,416

MACHINE FOR SPLITTING SKINS, HAVING AN ADJUSTABLE CALIBRATING ROLLER

Silvio Repetto, Modena, Italy, assignor to S.p.A. Luigi Rizzi & C., Modena, Italy

Filed Aug. 18, 1983, Ser. No. 524,297
Claims priority, application Italy, Sep. 10, 1982, 23216 A/82
Int. Cl.⁴ C14B *1/18*
U.S. Cl. 69—10 **8 Claims**



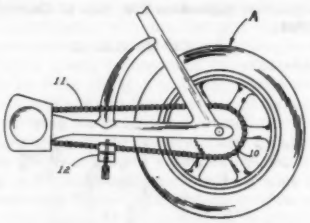
1. In a machine for splitting skins through their thickness, with an annular endless band blade, an upper bridge carrying a power-driven calibrating roller and a lower bridge having a feed and pressure roller, said rollers in turn being in contact respectively with a flower side and a flesh side of a skin, said upper bridge being swingable on upper hinges supporting the upper bridge on a machine support, the improvement wherein said calibrating roller is vertically adjustable and can be warped by flexure and a plurality of compensating rollers are provided to act against said calibrating roller, said compensating rollers being supported by a plurality of bearing means displaceable by hydraulic actuators, said bearing means including two bearing means supporting said calibrating roller at its ends and at least one bearing means between said ends, means being provided for the regulation of the positions of said actuators individually and jointly when the machine is stopped and during the splitting processing of each skin.

4,549,417

LOCK FOR CYCLES

Glenn Rivera, 473 Gregory St., Glendale Heights, Ill. 60139

Filed Nov. 25, 1983, Ser. No. 555,285
Int. Cl.⁴ B62H *5/06*
U.S. Cl. 70—18 **7 Claims**



1. A lock for a cycle having a sprocket and a sprocket chain in its drive chain, said lock being adapted to form an enclosure around a portion of said chain and being further adapted to be secured to said chain, wherein said lock comprises first and second rigid straps, said first strap extending upwardly vertically to form the back of said enclosure then forwardly in a

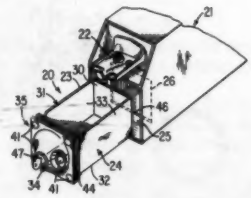
horizontal direction to form the top of said enclosure then downwardly in a vertical direction to form a front face of said enclosure; wherein said first strap includes a vertical depending portion which is adapted to extend below said chain when said chain is within said enclosure, wherein said second strap extends in front of said first strap and upwardly to form a vertical flange then forwardly in a horizontal direction to form the bottom of said enclosure then upwardly alongside an end portion of said first strap to form with said end portion a front side of said enclosure, wherein a pin is secured to a horizontal portion of one of said straps and a hole is disposed in said horizontal portion of the other of said straps which is capable of receiving an end of said pin as said pin is advanced toward it, wherein a first hole is disposed in said vertical depending portion of said first strap and a second hole is disposed in said vertical flange of said second strap, wherein said first and second holes are in register when said first and second straps are fitted together to form said enclosure, and wherein locking means extends through said registering holes to lock said first and second straps together.

4,549,418

LOCK BOX AND METHOD OF MAKING SAME

Mitchell A. Hall, Ft. Thomas, Ky., assignor to Monarch Tool & Manufacturing Co., Covington, Ky.

Filed Mar. 14, 1983, Ser. No. 475,141
Int. Cl.⁴ E05B *65/46*
U.S. Cl. 70—85 **18 Claims**



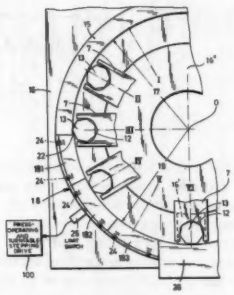
1. In a lock box mountable in an aperture of a cabinet wall and comprising; a coin receptacle dimensioned for passage through said aperture and having an open top and front wall means; a face member having a bore therethrough, a peripheral edge, an outside surface, and an inside surface; removable fasteners for fastening said receptacle to said face member by fastening said front wall means thereto; bolt means carried by said face member including at least one bolt movable to extended and retracted positions relative to a portion of said peripheral edge of said face member to engage a portion of said cabinet wall and fasten said lock box thereto upon extension of said bolt means; and a lock assembly carried by said face member and provided for operating said bolt means; said lock assembly being accessible by a key through said bore; the improvement comprising dual-purpose means for supporting said lock assembly inwardly of said inside surface and protecting same against removal thereof by thieves, said face member having a roughly cup-shaped central portion defined by an outer circular wall adjoined by a substantially frustoconical wall, said face member being made of a hard metal and having a hardened surface finish which makes cutting thereof very difficult, and said dual-purpose means comprising at least one headed bolt having a metal head disposed flush against said outside surface of said face member and within the confines of said frustoconical wall, said headed bolt serving to limit the locations where cutting through said face member might be attempted.

4,549,419

BLANK-FEEDING SYSTEM FOR DIE-STAMPING PRESS

Nikolaus B. Trost, and Heinz Groos, both of Netphen, Fed. Rep. of Germany, assignors to Firma Theodor Grabener, Netphen, Fed. Rep. of Germany

Filed Nov. 28, 1983, Ser. No. 555,472
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1982, 3244201
Int. Cl.⁴ B21D *43/02, 55/00;* B23G *9/00*
U.S. Cl. 72—4 **14 Claims**



1. In a plant for the embossing of blanks of polygonal outline, comprising a die press, a turntable with peripheral cutouts rotating stepwise in synchronism with the operation of said die press for feeding successive blanks to the latter for embossing, and loading means rotate from said die press for inserting fresh blank into empty cutouts of said turntable,

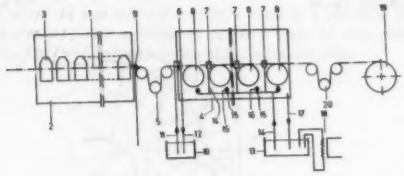
the improvement wherein each of said cutouts is a radially outwardly open recess provided above a table supporting said blanks, said recesses each having angular adjoining inner edges conforming to part of said polygonal outline and with two substantially parallel jaws spaced apart by about the maximum width of said blanks for receiving same in any angular position from said loading means, said recess having a radial depth less than the minimum width of said blanks, said inner edges being so oriented that a blank inserted in registry therewith protrudes beyond said jaws to a minor extend with one side of the polygon whereas a blank inserted out of registry protrudes to a larger extent with one corner,

the path of the inserted blanks being bounded in a first part thereof by a first ring segment centered on the axis of rotation of said turntable and separated from the orbit of said jaws by a first arcuate clearance accommodating blanks inserted in improper positions out of registry, said path being bounded in a second part thereof by a second ring segment centered on said axis of rotation and separated from said orbit by a narrower second arcuate clearance accommodating only blanks inserted in a properly reigistering position, an edge of said second ring segment adjacent said first ring segment forming a discontinuity tending to reorient an improperly positioned blank by engaging the protruding corner thereof, said second ring segment being provided with biasing means resiliently resisting a widening of said second arcuate clearance under pressure of an improperly positioned blank, said second ring segment being divided into a plurality of independently spring-loaded sections able to yield generally radially outward under pressure from an improperly positioned blank, one of said sections immediately adjoining said first ring segment forming said discontinuity while another of said sections is provided with sensing means responsive to an outward repression thereof for arresting said die press and said turntable.

4,549,420
METHOD FOR MANUFACTURING WIRE

Leon R. L. G. Cloostermans-Huwaert, Maarkedal, Belgium, assignor to Lamitref Aluminium, Hemiksem, Belgium

Filed Jun. 29, 1983, Ser. No. 509,019
Claims priority, application Luxembourg, Jul. 5, 1982, 84257
Int. Cl.⁴ B21B *15/00, 45/02;* **B21C** *1/04, 9/00*
U.S. Cl. 72—41 **1 Claim**



1. Method for manufacturing aluminum and aluminum alloy wire with a reduced cross-section from wire with a larger cross-section, which comprises the steps of:

first reducing the wire cross-section down to an intermediate cross-section by subjecting said wire to a plurality of cold-rolling reductions in a rolling section with a plurality of stands using a water suspension as lubricant,

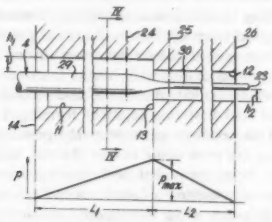
removing suspension remainders from the wire by means of a pressurized air stream,

then continuously further reducing the wire cross-section down to the required cross-section by drawing in a plurality of passes in a wire-drawing section while applying oil to said wire as a lubricant, the first step in the cross-section reducing by wire-drawing being performed by passing said wire through a roller die, and circulating the oil used for lubricating the roller die in a circuit which is completely independent from oil circuits which are used for lubricating the wire in the other drawing steps, the wire being cooled in a controlled way in the wire-drawing section.

4,549,421
METHOD AND APPARATUS FOR REDUCING THE SECTION OF ELONGATED COMPONENTS

Mohammed S. J. Hashmi, and George R. Symmons, both of Sheffield, England, assignors to National Research Development Corporation, London, England

Filed Apr. 20, 1984, Ser. No. 602,430
Claims priority, application United Kingdom, Apr. 26, 1983, 8311301
Int. Cl.⁴ B21C *9/00, 23/32, 3/00*
U.S. Cl. 72—41 **10 Claims**



5. Apparatus for reducing an elongated component in section and comprising:

a die presenting an axially-elongated cavity in which said reduction takes place, said cavity defining an axis of reduction and having an inlet and an outlet located at opposite ends of said cavity relative to said axis of reduction;

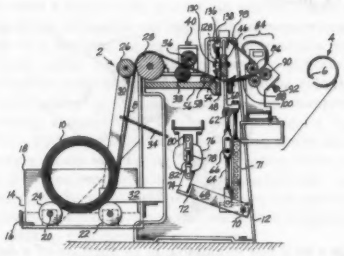
an axially-elongated reservoir having an axial length and communicating at a first end of its said axial length with said cavity inlet, said reservoir having a first aperture for the introduction of a lubricating and pressurising medium to said reservoir, and a second aperture located on said axis of reduction at a second and opposite end of the said axial length of said reservoir;

means for forcing said component through said reservoir and said cavity by way of said second aperture, cavity inlet and cavity outlet in succession, and for forcing said medium to pass from said reservoir through said cavity with said component, for reducing said component in section within said cavity by the action upon it of hydrodynamically-induced pressure within said medium but without contact with said die cavity, and means for imposing upon said component a gradual reduction in section thereof, said means comprising two axially-successive sections in said die cavity, at the meeting of which there is a substantially instant diminution in the radial dimension, relative to said axis of reduction, of said cavity for effecting said gradual reduction beginning at a first radial plane axially upstream of said dimunition of said radial dimension, and ending at a second radial plane axially downstream of said radial dimension.

4,549,422
CUP AND ROLL MACHINE

Donald A. Harrow, 8427 Delphi Rd. SW., Olympia, Wash. 98502

Filed Apr. 29, 1983, Ser. No. 490,169
Int. Cl.⁴ B21D *21/00, 1/02, 5/14, 28/00*
U.S. Cl. 72—131 **7 Claims**



1. Apparatus for forming sheet metal sleeves, comprising:

a frame; and

feed means, edge forming and cutting means, and roll forming means, in series:

said edge forming and cutting means comprising a vertically movable cutter blade and a vertically movable first forming member adjacent to said blade;

said roll forming means including a plurality of rollers forming a nip into which sheet metal to be formed is received;

said feed means being positioned to pull sheet metal from a roll and feed it below the cutter blade and first forming member when they are in a raised position, to and into the nip of the roll forming rollers;

said edge forming and cutting means further comprising a fixed second forming member so positioned and shaped that, when the first forming member and the cutter blade are lowered, the first forming member will engage the sheet metal and urge it against a portion of the second forming member to crease the sheet metal and then the cutter blade will cut the sheet metal along a line close to the crease; and

said feed means further comprising a loading rack attached to a lower portion of the infeed end of the frame for supporting a roll of uncut sheet metal; a first pair of feed rollers supported on the infeed end of the frame above and on the outfeed side of the roll of sheet metal, said rollers

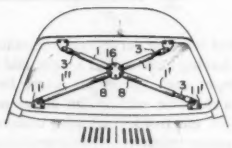
including a pressure roller and a guide roller positioned on the outfeed side of the pressure roller with the axis of the pressure roller being slightly below the axis of the guide roller; biasing means for biasing the pressure roller toward the guide roller; a second pair of feed rollers supported on the frame on the outfeed side of the first pair of rollers and positioned to have lines of contact with the sheet metal that are below the uppermost portion of the guide roller of the first pair of rollers; and means for guiding the sheet metal into position to be cut by the edge forming and cutting means; said first and second pairs of feed rollers being positioned to pull the sheet metal up from under the outfeed side of the roll and to roll the sheet metal in a direction opposite to the curvature of the roll to remove memory of the curvature of the roll.

4,549,423

SCREW BODY JACK AND A BODY JACK ASSEMBLY

Saburo Masui, Tokyo, Japan, assignor to Yasui Sangyo Co., Ltd., Japan

Filed Feb. 23, 1983, Ser. No. 469,012
Int. Cl.[4] B21D *1/12*
U.S. Cl. 72—295 **5 Claims**



1. A body jack assembly for correcting the deformation of a metallic structure or for deforming a metallic structure, comprising:

at least one screw body jack element whose length may be adjusted even under tension or compression;

at least two more body jack elements which are capable of supporting either compression or tension;

a circular central bracket piece having a coupling means comprising several holes disposed in a circular array for pivotally connecting one end of each of the body jack elements in a plurality of configurations to permit said jack elements to be used to produce forces in desired directions in both tension and compression, namely (a) all in tension, (b) all in compression and (c) some in tension and some in compression;

clamping means having mounting means by which it may be securely clamped in a fixed orientation on the metallic structure whose deformation is to be corrected and are each adapted for pivotal connection with the other end of each of the body jack elements.

4,549,424

SHELL TOOLING METHOD

Joseph D. Bulso, Jr., Canton, Ohio; Stephen D. Doyle, Knoxville, Tenn., and James A. McClung, North Canton, Ohio, assignors to Redicon Corporation, Canton, Ohio

Division of Ser. No. 503,343, Jun. 10, 1983, Pat. No. 4,516,420. This application Oct. 5, 1984, Ser. No. 657,831
Int. Cl.[4] B21D *28/02*
U.S. Cl. 72—329 **2 Claims**

1. A method of forming an end panel for a two-piece container from a piece of metal in a double acting press comprising the steps of:

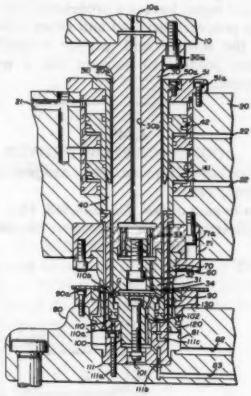
(A) engaging the metal with a sleeve under fluid pressure;

(B) blanking the metal against a cut edge to form a panel;

(C) wiping the panel against a fixed die core ring with a punch shell which telescopes over the die core ring to form a peripheral flange on the panel;

(D) initially forming a chuckwall in the panel by engaging the central portion thereof with a punch core;

(E) finally setting the chuckwall by drawing the panel over the die core ring by further movement of the punch core while



(1) supporting the panel with a fluidly supported piston beneath the chuckwall area in opposed relationship to and in cooperation with the punch core;

(2) holding pressure on the top of the panel against the die core ring, and

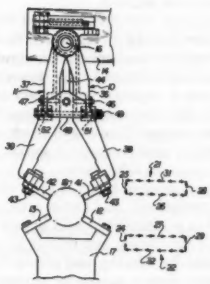
(3) supporting the peripheral flange of the panel between the periphery of the punch shell and the periphery of the die core ring.

4,549,425

FORGING MACHINE TRANSFER WITH MISALIGNMENT DETECTOR

Robert E. Wisebaker, and Richard Edmondson, both of Tiffin, Ohio, assignors to The National Machinery Company, Tiffin, Ohio

Continuation-in-part of Ser. No. 513,700, Jul. 14, 1983, abandoned. This application Oct. 6, 1983, Ser. No. 539,523
Int. Cl.[4] B21J *13/10*
U.S. Cl. 72—422 **16 Claims**



1. In a forging machine providing a work station at which workpieces are formed and a transfer operable to grip a workpiece at a gripping location and transfer such workpiece to said work station, said transfer comprising a transfer frame, gripper means on said transfer frame providing at least one substantially rigid gripper, non-deformable connection means con-

necting said gripper and frame permitting movement of said gripper relative to said transfer frame, said gripper means including operating means operable to create a gripping force causing said gripper to assume a predetermined position when a workpiece is properly gripped and to assume other positions when a workpiece is improperly gripped, and signal generating means independent of operating means connected to said gripper operable to produce a signal which is a function of the position of said gripper and which is independent of said gripping force, said signal having a predetermined value when said workpiece is properly gripped and other values which are a function of the amount said gripper is displaced from said predetermined position to indicate that a workpiece is not properly gripped.

4,549,426

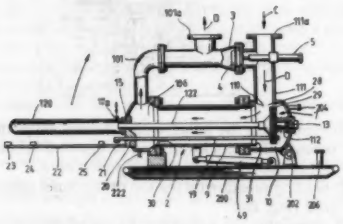
COMPACT FLOW PROVER

Charles D. Erickson, Houston, Tex., assignor to Smith Meter, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 546,568, Oct. 28, 1983,. This application Aug. 15, 1984, Ser. No. 641,029

Int. Cl.[4] G01F *25/00*

U.S. Cl. 73—3 **28 Claims**



1. A compact flow prover, comprising:
(a) fluid inlet conduit;
(b) a housing comprising:
(i) a main cylinder having a substantially uniform inside diameter;
(ii) an inlet section having an inside diameter greater than the inside diameter of said main cylinder, said inlet section being in fluid communication with said inlet conduit and said inlet end of said main cylinder; and
(iii) a downstream section having an inside diameter greater than the inside diameter of said main cylinder, said downstream section being in fluid communication with the downstream end of said main cylinder;
(c) an outlet conduit being in fluid communication with said downstream section;
(d) a displacer movably disposed within said housing, said displacer having an upstream face, a downstream face, and displacer seal means for forming a fluid barrier between said inlet and said downstream ends while said displacer is disposed within said main cylinder;
(e) means for detecting the longitudinal disposition of said displacer in said housing at predetermined positions;
(f) means for returning said displacer from said downstream section to said inlet section;
(g) a bypass conduit being in fluid communication with said inlet conduit and said outlet conduit;
(h) a valve positioned in said bypass conduit which can be opened for placing said prover in a displacer return mode or closed for placing said prover in a proving mode;
(i) displacer launch means for encouraging said displacer to enter said main cylinder from said inlet section while a fluid is flowing therethrough, said launch means including means for creating a higher pressure force on said upstream face of said displacer than on said downstream face, said creating means including a shaft axially connected to the downstream face of said displacer, said shaft being of sufficient length to extend beyond said downstream section while said displacer is disposed within said inlet section; and
(j) inlet guide means for maintaining the axial alignment of said displacer while said displacer is disposed within said inlet section, said inlet guide means comprising:
(i) a displacer pilot axially extending from the upstream face of said displacer; and
(ii) an axial sleeve located in said inlet section, said sleeve axially aligned with said displacer pilot.

4,549,427

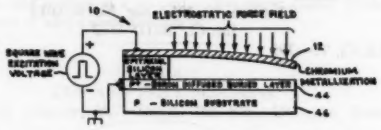
ELECTRONIC NERVE AGENT DETECTOR

Edward S. Kolesar, Jr., Austin, Tex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 19, 1983, Ser. No. 533,331

Int. Cl.[4] G01N *31/06*

U.S. Cl. 73—23 **1 Claim**



1. A chemical warfare nerve agent detector comprising:
a container having a cover and a case, said container having therein input and output air ports for circulating air through a detector section, an alarm port, an indicator display, an electronics section comprising electronic means, a power section, and said container having attaching means whereby said detector can be worn by a person;
at least one transducer mounted within said detector, said at least one transducer having an active cantilever oscillator and a reference cantilever oscillator, each of said at least one transducers having cantilevers essentially similarly shaped so that their natural resonant frequencies are closely matched, said cantilevers being electrically connected to said electronic means for detecting and measuring their oscillation frequencies, said cantilevers being mounted over a rectangular shaped well, the sides of said well comprising an insulating layer, the bottom of said well comprising a highly doped layer of semiconducter material, said highly doped layer being electrically connected to said electronic means, said highly doped layer being deposited on a silicon substrate that is mounted in said detector section, said active cantilever oscillator being chemically absorptive to a chemical agent by absorbing said chemical agent on a chemically selective substance attached to said active cantilever and said active cantilever being composed of metallic material, said reference cantilever oscillator having a reference cantilever being composed of metallic material, said chemically selective substance being a chemical composition selected from the group consisting of:
(1) XAD-4-Cu^{2+}-diamine;
(2) Cu $(Butyrate)_2$. Ethylenediamine;
(3) PVBC - Triethylenetetraamine - Cu^{2+}- Chloride;
(4) PVBC - Tetramethylethylenediamine - Cu^{2+}- Chloride;
(5) PVP - Tetramethylenediamine - Cu^{2+}- Chloride;
(6) PVP - Triethylenetetraamine - Cu^{2+}- Chloride; and
(7) PVP - 2, 2'- Bipyridine - Cu^{2+}- Chloride;
an air pump for causing an air flow through said detector section and over said at least one transducer in said detector section; and
said electronic means further comprising means for detecting the absorption of said chemical agent on said active cantilever wherein the frequency of said active cantilever

is compared to the frequency of said reference cantilever, said electronic means measuring the amount of said chemical agent absorbed on the active cantilever by comparing the differences in frequencies between said active cantilever oscillator and said reference cantilever oscillator, said electronic means mounted in said electronic section, and electrically connected to said transducer, an alarm, and said indicator display and batteries for supplying electric power, said batteries being removably mounted in said power section.

4,549,428

DEVICE FOR THE DETERMINATION OF THE AMOUNT OF SUBSTANCE OR THE DENSITY OF FIBER STRUCTURES

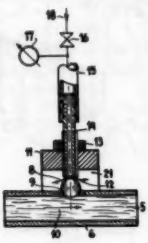
Erwin Murbach, Naenikon, and Jean Peter, Moenchaltorf, both of Switzerland, assignors to Zellweger Uster Ltd., Uster, Switzerland

Filed Feb. 22, 1983, Ser. No. 468,188

Claims priority, application Switzerland, Feb. 19, 1982, 1040/82

Int. Cl.⁴ D01H *5/38*; G01N *9/26*

U.S. Cl. 73—32 R **10 Claims**



1. An apparatus for determining the substance amount or density of quantities of fibers, comprising

guide means including a duct for guiding said quantity of fibers through a space of predetermined constant cross section in said duct, said duct having an opening in the side thereof in communication with said space;

a passive body disposed in said opening in said duct so as to partly extend into said duct and thereby be subjected to an outwardly-directed pressure from said fibers in the radial direction of said duct, which pressure is proportional to the elasticity of the fibers in said duct for a group of fibers having said predetermined cross section;

means for subjecting said passive body to a variable inwardly-directed pressure in the radial direction of said duct to place said passive body in a state of equilibrium with respect to said outwardly-directed pressure; and

means for indicating the value of said inwardly-directed pressure, and thereby, a measure of the substance amount or density of the quantity of said fibers at the time said equilibrium is achieved.

4,549,429

METHOD OF CHECKING FOR HYDRAULIC LEAKAGE

Lynn E. Kurt, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Dec. 2, 1983, Ser. No. 557,709

Int. Cl.⁴ G01M *3/26*

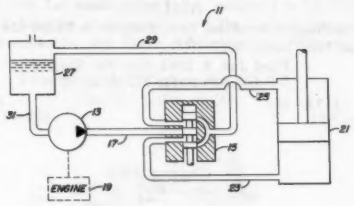
U.S. Cl. 73—40 **2 Claims**

1. A method of detecting leakage in a closed center hydraulic circuit driven by a prime mover in driven feedback responsive communication with a variably displaceable pump unit, said hydraulic circuit including said pump unit, in fluid communication with a control valve for selectively directing hydraulic fluid to respective branches of said circuit, each branch having a fluid responsive displaceable work element, comprising the steps of:

(a) positioning all said work elements in an extreme position;

(b) placing said control valve in a neutral position;

(c) locking out said feedback communication between said prime mover and said pump unit;



(d) setting said prime mover to a reference RPM;

(e) destroking said pump unit; and

(f) comparing said change in prime mover RPM to a reference change in RPM whereby a change in RPM above a reference change in RPM indicates a leak in said circuit between said pump and control valve.

4,549,430

SENSOR

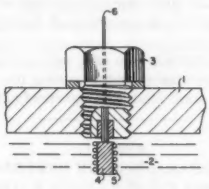
Klaus Dobler; Rudolf Heinz, both of Gerlingen; Ulrich Schoor, Stuttgart, and Thomas Frey, Rutesheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 346,034, Jan. 28, 1982, abandoned. This application Apr. 10, 1984, Ser. No. 597,588

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1980, 3028188

Int. Cl.⁴ G01M *19/00*

U.S. Cl. 73—115 **8 Claims**



1. Combination glow plug and combustion pressure sensor for providing pre-glowing heat and for ascertaining pressure in the combustion chamber of an internal combustion engine comprising:

an insulated support carrier (**40**) located to be positioned within the combustion chamber of the engine upon assembly of the plug-sensor combination to the engine;

an electrical conductor positioned on said support carrier and comprising a material which changes its resistance under the influence of pressure against its surface, and hence located to be positioned within the combustion chamber of the engine upon assembly of the senor to the engine;

connection means (**22, 23**) coupled to said conductor for applying electrical energy thereto for heating the space surrounding the conductor and thereby provide for preheating of the combustion chamber of the engine;

and a resistance evaluation circuit (**24, 25, 26**) additionally coupled to said connection means for determining the resistance of the conductor, said conductor (**21**) thereby

having the dual function of pre-heating or pre-glowing for starting of the engine and pressure sensing for determination of operating pressure in the combustion chamber of the engine.

4,549,431

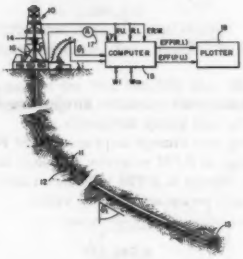
MEASURING TORQUE AND HOOK LOAD DURING DRILLING

Edy Soeiinah, Carrollton, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 4, 1984, Ser. No. 568,303

Int. Cl.[4] E21B *45/00, 49/00*

U.S. Cl. 73—151 **15 Claims**



1. In the computer-aided method of detecting problems in the drilling of a well in the earth, the method of measuring the pick up, running in and free rotating loads on the drill string at a particular depth of the bit in said well comprising:

positioning said bit at said particular depth;

free rotating said drill string;

while free rotating, measuring the steady state hook load on said drill string;

moving said drill string out of said well for an incremental distance;

while moving said drill string, measuring and recording the initial and overall maximum hook loads and the steady state hook load;

moving said drill string into said well over said distance;

while moving, measuring and recording the initial and overall minimum hook loads and the steady state hook load.

4,549,432

METERING SEPARATOR FOR DETERMINING THE LIQUID MASS FLOW RATE IN A GAS-LIQUID OILFIELD PRODUCTION STREAM

Linden Bland, Calgary, and Clifford J. Anderson, Sherwood Park, both of Canada, assignors to Murphy Oil Company Limited, Calgary, Canada

Filed Jan. 23, 1984, Ser. No. 572,912

Int. Cl.[4] G01F *15/08*

U.S. Cl. 73—200 **3 Claims**

2. A metering separator for metering the liquid content of a production well stream containing liquid and gas, comprising:

a closed, generally cylindrical vessel forming a single internal chamber having an upper gas separation zone and a lower liquid collection zone;

means, associated with the upper end of the vessel, for introducing the stream into the upper zone and inducing it to spin to form a central gas vortex and an outer, downwardly-descending, liquid-containing layer which accumulates as a batch in the liquid collection zone;

outlet means, associated with the lower end of the vessel and communicating with the chamber, for removing collected liquid therefrom;

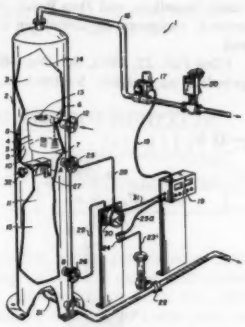
dump valve means, associated with the outlet means, for controlling liquid removal therethrough;

gas outlet means, associated with the upper end of the vessel and communicating with the chamber, for removing separated gas therefrom;

means, associated with the gas outlet means, for maintaining backpressure within the chamber;

first and second pressure sensors mounted in vertically spaced apart relationship in the vessel wall, the upper sensor being operative to measure only the gas backpressure in the chamber, the lower sensor being operative to measure the combined head of the gas backpressure and the head of liquid extending above said sensor, said sensors being further operative to transmit pressure signals indicative of said measurements;

first means, operatively connected to the sensors, for establishing a measure of the differential pressure and emitting a signal indicative thereof;



second means, operatively connected to the first means and the dump valve means, for monitoring said differential pressure measurements and opening said dump valve means, when the signals indicate that a batch of a first pre-determined weight has been accumulated, and closing said dump valve means, when the signals indicate that the liquid still remaining in the collection zone has a weight equal to a second pre-determined value;

means for monitoring the times taken to accumulate and discharge each batch;

and means, associated with said weight and time monitoring means, for computing and displaying an indication of the mass flow rate of liquid passing through the vessel.

4,549,433

DEVICE FOR MEASURING THE MASS OF A FLOWING MEDIUM

Heinz Gneiss, Ludwigsburg; Jaihind S. Sumal, Vaihingen, and Werner Wünsch, Markgröningen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 29, 1984, Ser. No. 617,057

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1983, 3328853

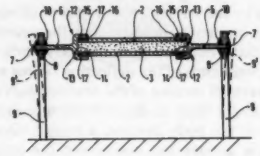
Int. Cl.[4] G01F *1/68*

U.S. Cl. 73—204 **6 Claims**

1. A device for measuring the mass of a flowing medium, comprising a substantially rectangular carrier body, at least one temperature-dependent resistor layer of electrically conductive material on said carrier body, said at least one temperature-dependent

resistor layer disposed in the flow path of the medium to be measured, at least two oppositely disposed electrical conductor connections in alignment with one another and secured at one end to a different end face of the carrier body in electrical contact with said at least one temperature-dependent resistor and supported at one end by a holder body, in which each of said electrical conductor

connections are oriented toward the carrier body and each electrical conductor connection has at least one fastening segment which extends onto an end of said carrier, each said fastenting segment of each electrical conductor connection, is embodied in the shape of a U, and partially encompasses and grips the carrier body on



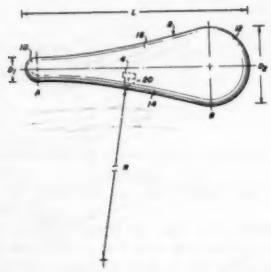
both sides of each end of said carrier body, an electrically conductive layer electrically conductively connected with said electrical conductor connection and the temperature-dependent resistor layer, and the fastening segment of each electrical conductor connection is soldered to the electrically conductive layer.

4,549,434

PRESSURE LEVEL SENSOR

Lawrence B. Marsh, Silver Spring, Md., assignor to Marsh-McBirney, Inc., Gaithersburg, Md.

Filed Oct. 26, 1984, Ser. No. 665,004
Int. Cl.[4] G01F *23/14, 9/00*
U.S. Cl. 73—299 **12 Claims**



1. Apparatus for mounting a pressure transducer in a fluid flow channel to measure the depth of the fluid, comprising

an elongated wedge-shaped sensor member including

(a) a generally planar bottom wall adapted for placement on the bottom of a channel;

(b) front and rear wall portions connected with said bottom wall, said front wall portion having a horizontally convex surface configuration and a width less than the width of said rear wall portion, said rear wall portion having a width less than the length of said sensor member;

(c) a pair of side wall portions arranged between said front and rear wall portions, each side wall portion having a horizontally concave surface configuration, the radius of curvature of said convex side wall portions being a function of the length of said sensor member; and

(d) a top wall portion arranged between said front, rear and side wall portions; and

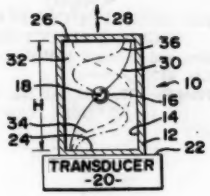
(e) at least one of said side wall portions containing a horizontal opening adjacent said bottom wall for communication with the pressure transducer arranged within the sensor member, whereby when the sensor member is arranged on the bottom of a channel with the front wall portion facing the upstream direction of fluid flow, the velocity vector of the fluid flow is perpendicular to the direction of extension of said opening, thereby to minimize flow velocity effects on the pressure transducer.

4,549,435

VIBRATING-CHAMBER LEVITATION SYSTEMS

Martin B. Barmatz, Glendale; Dan Granett, Los Angeles, and Mark C. Lee, LaCanada, all of Calif., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 14, 1983, Ser. No. 561,433
Int. Cl.[4] G10K *10/00*
U.S. Cl. 73—505 **14 Claims**



1. Apparatus for establishing an acoustic standing wave pattern comprising:

a housing that forms a substantially closed chamber, and

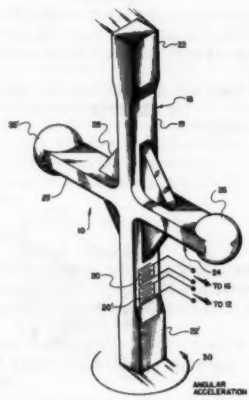
means for moving all of said housing in a substantially undistorted state back and forth along at least a predetermined axis at a frequency which produces an accoustic standing wave pattern within said chamber, whereby to maintain an essentially constant position for a levitated object.

4,549,436

SURFACE-ACOUSTIC-WAVE, DIGITIZED ANGULAR ACCELEROMETER

Sarkis Barkhoudarian, Canoga Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 31, 1983, Ser. No. 547,289
Int. Cl.[4] G01P *15/08*
U.S. Cl. 73—517 A **12 Claims**



1. A sensing element for sensing angular acceleration in terms of the torsional strain it produces comprising:

a longitudinal strain member in the form of a flat beam, the strain beam being formed from a material the elastic prop-

erties of which change in proportion to the amount of torque experienced by the material; and

a longitudinal torsion member in the form of a flat beam the longitudinal axis of which crosses the longitudinal axis of the strain member, said torsion beam being formed with an end mass at each end, the beams being in such orientation to each other that the flat sides of each beam would rotate into the flat sides of the other beam if one of said beams were rotated 90 degrees,

said strain member being affixed at each end to a body whose angular acceleration is to be measured,

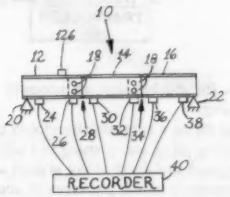
the strain member being affixed to the body in an orientation such that the angular acceleration vector of the body lies along the axis of the strain member.

4,549,437

ACOUSTIC TESTING OF COMPLEX MULTIPLE SEGMENT STRUCTURES

Janine J. Weins, and Michael J. Weins, both of 6 Allen St., Lebanon, N.H. 03766

Filed Sep. 27, 1983, Ser. No. 536,375
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—587 **11 Claims**



1. An in service method of monitoring the structural integrity of a complex multiple segment structure, such method comprising the steps of:

(a) providing at least one acoustic sensor to each segment of the complex multiple segment structure;

(b) recording acoustic emissions sensed by said acoustic sensor, said acoustic emissions resulting from said service; and

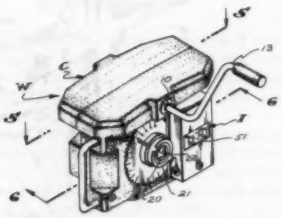
(c) analyzing the time dependence of said recorded acoustic emissions to determine deviations.

4,549,438

TORQUE MULTIPLYING TORQUE WRENCH

Bosko Grabovac, Arcadia, and Ivan Vuceta, Walnut, both of Calif., assignors to Consolidated Devices, Inc., City of Industry, Calif.

Filed Jul. 25, 1983, Ser. No. 516,777
Int. Cl.[4] B25B *23/142*
U.S. Cl. 73—862.21 **20 Claims**



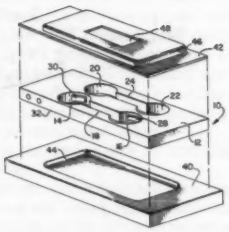
1. A torque wrench structure comprising a case, a reduction gear train within and supported by the case and including an input shaft with an end accessible at the exterior of the case and an output shaft, a work engaging part at the exterior of the case concentric with the output shaft, coupling means drivingly coupling the work engaging part to the output shaft, a reaction part with a body portion with a central axis concentric with the output shaft and having an opening freely accommodating said coupling means, a plurality of elongate locking pins in predetermined circumferential and radial spaced relationship about the central axis of and projecting freely from the body portion and from the case to engage in lock pin receiving means of a related reaction structure related to a part to be worked upon by the wrench, a plurality of elongate deflection beams spaced circumferentially about the central axis of and projecting radially outward from the body portion, stop means between the outer ends of the deflection beams and the case to stop circumferential turning of the reaction part relative to the case, strain gauges fixed to the deflection beams between the stop means and the body portion, a bridge circuit connected with the strain gauges and comparing the resitance of said gauges and transmitting a resultant signal and a digital readout device connected with the bridge circuit and receiving the resultant signal and displaying digits corresponding to the forces transmitted by the wrench through said work engaging part thereof.

4,549,439

MOISTUREPROOF LOAD CELL FOR FOOD PROCESSING APPLICATIONS AND METHOD FOR MAKING THE SAME

Harry J. Keen, Waterford, and L. Paul Barrett, Concord, both of Vt., assignors to Colt Industries Operating Corp, New York, N.Y.

Filed Jun. 19, 1984, Ser. No. 622,253
Int. Cl.[4] G01L *1/22*; H01C *1/02*
U.S. Cl. 73—862.65 **18 Claims**



1. A load responsive transducer device comprising a transducer body electrical transducer means mounted on said transducer body to provide an output indicative of the magnitude of a force applied to said transducer body, and encapsulating means adhered to said transducer body and completely encapsulating said electrical transducer means, and encapsulating means being formed by a mixture of silicone gel and oil.

4,549,440

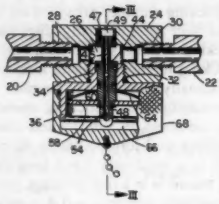
FLUID SAMPLING VALVE

Paul J. E. Fournier, Jackson, and Russell L. Rogers, Munith, both of Mich., assignors to Aeroquip Corporation, Jackson, Mich.

Continuation-in-part of Ser. No. 450,370, Dec. 16, 1982, Pat. No. 4,484,482. This application Mar. 29, 1984, Ser. No. 594,843
Int. Cl.[4] G01N *1/10*
U.S. Cl. 73—863.85 **11 Claims**

1. A fluid sampling valve for internal combustion engines and the like, comprising, in combination, a body, a passage defined in said body having an inlet and an outlet, a valve element receiving orifice defined in said body intersecting said passage, a valve element within said orifice movable between open and closed positions wherein fluid within said passage flows through said orifice when said valve element is in said

open position, pressure balancing means defined on said valve element in communication with said passage and sample col-



lecting container engaging means defined upon said valve element for actuation of said valve element between said open and closed positions by a sample collecting container.

4,549,441

ARM MECHANISM OF A PUSHBUTTON TYPE TUNER

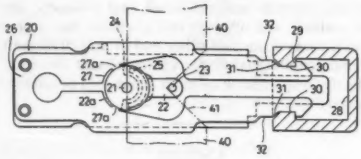
Takao Chaki, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed May 11, 1983, Ser. No. 493,543

Claims priority, application Japan, May 14, 1982, 57-70367[U]

Int. Cl.⁴ H03J *5/12*

U.S. Cl. 74—10.33 **3 Claims**



1. Arm mechanism of a pushbutton type tuner including:

a pushbutton;

an arm, on the base side of which said pushbutton is mounted;

a setting plate mounted on said arm rotatably around a setting pin fixed to said arm, said setting plate having an arc shaped contacting part on the extremity side of the arm;

a memory slide displaceable to select a frequency depending upon which pushbutton is pushed in, said memory slide having a V-shaped notch, with which a pressing protrusion disposed upwardly at the extremity of said setting plate on the base side of the arm is engaged;

an approximately U-shaped plate spring disposed at the periphery of said setting plate and having an open end on the base side of the arm, said plate spring being fixed to the arm on the extremity side of the arm, the extremity of the two branches of said plate spring being pushed by protrusions disposed at the inner side of said pushbutton toward the center line of the arm so that the distance therebetween becomes smaller, when said pushbutton is completely mounted, and said distance becoming larger, when said pushbutton is extracted half-way;

a tightening part formed on the inner side of said plate spring against the contacting part of said setting plate; and

a pair of tightening protrusions disposed on said tightening part, interposing the center line of the arm therebetween in contact with the contacting part of said setting plate;

whereby, when a pushbutton is mounted completely on the base side of the arm and said plate spring and said protrusions disposed at the inner side of said pushbutton press the extremity of the right and left branches of said U-shaped plate spring toward the center line of the arm to reduce the distance between the extremity of said branches, said tightening protrusions fix said setting plate with respect to the arm and when the pushbutton is extracted half-way, said setting plate is released.

4,549,442

EXPANDING WEDGE ACTUATION DEVICE

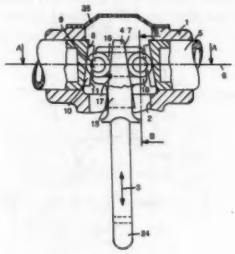
Rüdiger Hans, Niederwerrn, and Manfred Brandenstein, Eussenheim, both of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Aug. 12, 1983, Ser. No. 522,742

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1982, 3230316

Int. Cl.⁴ F16D *51/00*

U.S. Cl. 74—110 **8 Claims**



1. A wedge mechanism particularly adapted for expanding brakes of motor vehicles including a housing, a wedge member, a pair of push rods displaceably supported in the housing acting upon the brake shoes of the brake by opposing displacement in a common perpendicular direction, rollers arranged between one of the two wedge surfaces of the wedge member and a complementary inclined surface of the push rod located opposite it, a cage for the rollers, which in relation to the spreading wedge is movable in a longitudinal direction and which in turn has two parallel side portions running in a perpendicular direction, with machined openings in them in the direction of the axis of rotation of the rollers for guiding the ends of the rollers facing the side portions, characterized in that both rollers (**9**) have a face (**20,27**) at their ends, gradually changing over into their roller surface (**21**) confronting the inclined wedge surfaces and that the opening in the roller cage (**13**) is formed by a common recess (**16,26**) for said rollers (**9**) formed on the inside of each side portion (**15**) of the roller cage (**13**) for the complementary inclined surface (**8**) of the push rods (**5**), the edge surfaces (**17**) of which, facing each other in longitudinal direction (**3**) closely embrace the ends of the rollers (**9**) longitudinally and the bottom surfaces (**19**) of which are arranged to support the opposing face (**20,27**) of the rollers (**9**), respectively.

4,549,443

MULTI-SPEED REVERSIBLE TRANSMISSION OF COUNTERSHAFT CONSTRUCTION

Basil White, Rockford, Ill., assignor to Twin Disc, Incorporated, Racine, Wis.

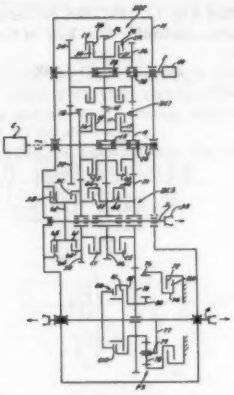
Filed Dec. 7, 1983, Ser. No. 558,810

Int. Cl.⁴ F16H *3/08, 37/00, 3/44;* F16D *19/00*

U.S. Cl. 74—360 **6 Claims**

1. A multi-speed reversible transmission of the countershaft construction type for providing twelve forward speeds and six reverse speeds and comprising a housing, four shafts mounted in said housing and arranged in parallelism; said shafts including a power input shaft, a power output shaft, an intermediate shaft, and a high-input and reverse direction shaft; said power

input shaft, said high-input and reverse direction shaft and said intermediate shaft each having a duplex clutch mounted thereon; each duplex clutch have two clutches arranged side-by-side, each clutch having a gear at one side thereof and driveable thereby, each duplex clutch also having a central gear forming a pair of clutch actuating pressure chambers and said central gears being rotatably mounted on their respective shaft, said central gear of said input shaft duplex clutch being in constant mesh with the said central gears of said other two duplex clutches, said power input shaft also having an input gear fixed thereto for delivering power to one of said clutch



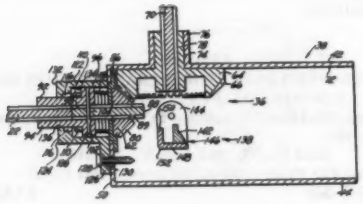
side gears of said high-input and reverse shaft, said output shaft having an output gear rotatably journalled thereon and in constant mesh with one of the clutch side gears of said intermediate shaft and driven thereby, said output shaft also having a high-speed range clutch detachably connected between said output shaft and said output gear, a low-speed range brake anchored in said housing, said output shaft also having a planetary gear system driven by said output gear and connected between said output gear and said low-speed range brake, whereby either said high-speed range clutch or said low-speed range brake can be used selectively with said output gear to permit drive to said output shaft.

4,549,444

LOCKING GEAR DRIVE

William F. Forquer, Venice, Fla., assignor to Security Shutter Corp., Venice, Fla.

Filed Sep. 27, 1982, Ser. No. 424,376
Int. Cl.⁴ F16H *57/10, 1/14, 1/20*
U.S. Cl. 74—411.5 **6 Claims**



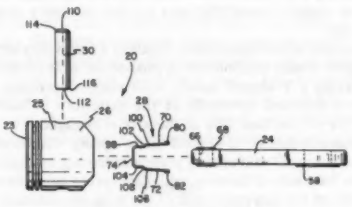
1. A locking mechanism for a gear drive for raising and lowering a curtain of hingedly interconnected slats, said gear drive having a driveshaft coupled to a driving gear, a driven gear meshing with said driving gear, a driven shaft coupled to said driven gear and a drum-like rotatable member driven by said driven shaft for winding and unwinding said curtain of slats therearound, said locking mechanism comprising a longitudinally displaceable member affixed at an end of said driveshaft, at least one locking member provided on a portion of the exterior surface of said longitudinally displaceable member, stationary interlocking members each disposed in close proximity with said locking member, biasing means longitudinally urging said longitudinally displaceable member and driveshaft in a direction inter-engaging said locking member and one of said inter-locking members in interlocked relationship, and holding means holding said longitudinally displaceable member and driveshaft in a relatively fixed longitudinal position when said holding means is in a first position and allowing said longitudinally displaceable member and driveshaft to be longitudinally displaceable against said biasing means such as to disengage said locking member from each of said interlocking members when said holding means is in a second position, wherein a socket member is mounted on an end of said driveshaft, said socket member having means for coupling with the end of a handcrank adapted to drive said driveshaft in rotation and to longitudinally displace said driveshaft and longitudinally displaceable member against said biasing means thereby disengaging said locking member from said interlocking member, said biasing means is a compression spring disposed around said driveshaft, said compression spring being further disposed between a bearing member supporting said driveshaft and said socket member fixedly mounted at said end of said driveshaft, and said holding means comprises a pivotable bar disposed proximate the other end of said driveshaft such as to obstruct longitudinal displacement of said driveshaft and longitudinally displaceable member when said pivotable bar is in said first position, and wherein said pivotable bar is pivotably displaceable away from said other end of said driveshaft such as to permit longitudinal displacement of said driveshaft and longitudinally displaceable member when said pivotable bar is in said second position.

4,549,445

YOKE THRUST BEARING FOR A PISTON AND CONNECTING ROD ASSEMBLY

Vernon R. Kaufman, Cedarburg, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Dec. 12, 1983, Ser. No. 560,531
Int. Cl.⁴ F16J *7/00*
U.S. Cl. 74—579 R **8 Claims**



1. A piston and connecting rod assembly, comprising:
a piston head having a pair of wrist pin bosses therein, said wrist pin bosses having respective faces in spaced-apart and facing relationship with each other and respective bores in axial alignment with each other, said faces each including a depression,
a connecting rod having one end thereof disposed between said faces, said one end having an opening in axial alignment with both said bores,
a wrist pin member in said bores and said opening to pivotally connect said connecting rod and said piston, and
a one-piece bearing device comprising a pair of washer portions having apertures therein for receiving said wrist

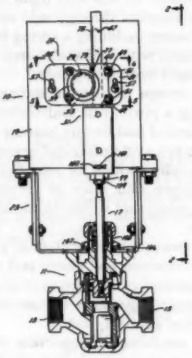
pin member and respectively disposed between said faces and said connecting rod one end, said washer portions abutting against respective ones of said faces and including respective projections, said projections being complementary with said depressions and received therein to prevent rotation of said bearing means around said wrist pin member, and a yoke portion extending around said connecting rod one end and interconnecting said washer portions.

4,549,446

MOTORIZED VALVE ACTUATOR

Charles F. Beeson, Goshen, Ind., assignor to Johnson Service Company, Milwaukee, Wis.

Filed Feb. 6, 1984, Ser. No. 577,193
Int. Cl.[4] F16K *31/05*
U.S. Cl. 74—625 **13 Claims**



1. A motorized valve actuator including:
an electric drive motor having a rotatable shaft for providing an actuating torque;
an output member for operating a valve to be coupled thereto;
a gear member adapted to be manually removably mounted intermediate said shaft and said output member in a first position or in a second position;
said gear member including an interior, torque transmitting profile for driving coupling of said shaft and said output member when said gear member is mounted in said first position;
said gear member further including a counterbore for decoupling said output member from said shaft when said gear member is mounted in said second position, thereby permitting said output member to be driven by a source of power external to said actuator and applied to said output member using said torque transmitting profile.

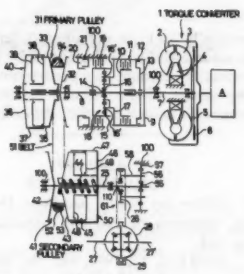
4,549,447

BELT DRIVE CONTINUOUSLY-VARIABLE SPEED AUTOMATIC TRANSMISSION

Shiro Sakakibara, Toyokawa, Japan, assignor to Aisin Warner Kabushiki Kaisha, Aichi, Japan

Filed Jan. 26, 1982, Ser. No. 342,637
Claims priority, application Japan, Feb. 2, 1981, 56-13996
Int. Cl.[4] F16H *37/00, 37/08*
U.S. Cl. 74—689 **6 Claims**

1. A belt drive continuously-variable speed automatic transmission for a motor vehicle, comprising:
a housing;
a fluid coupling supported on said housing;
an input shaft connected to the output side of said fluid coupling and rotatably supported on said housing;
an intermediate shaft rotatably supported on said housing coaxially with said input shaft and rotatable relative to said input shaft;
means for transmitting motion of said input shaft to said intermediate shaft;
an output shaft rotatably supported on said housing in parallel with said intermediate shaft;
a belt drive continuously-variable speed transmission means including a primary variable-pitch pulley having a fixed pulley flange fixed concentrically to said intermediate shaft and a movable pulley flange axially slidable relative to said fixed pulley flange, a secondary variable-pitch pulley having a fixed pulley flange fixed concentrically to said output shaft and a movable pulley flange axially slidable relative to said fixed pulley flange, and a belt extended between said primary variable-pitch pulley and said secondary variable-pitch pulley for transmitting the rotation of said intermediate shaft to said output shaft at a continuously-variable ratio of rotational speed between said intermediate shaft and said output shaft by varying the working radial position of said belt on said primary and secondary variable-pitch pulleys;



differential gear means including a differential gear box, the right and left driving axles and differential gear wheels associated with the driving axles being rotatably supported on said housing with the driving axles arranged in parallel with said output shaft;
a first sprocket wheel rotatably mounted on said housing coaxially with said output shaft and in a plane perpendicular to the axis of rotation of said output shaft;
reduction gear means provided on said output shaft and having an input end thereof connected to said output shaft and an output end thereof connected to said first sprocket wheel, said first sprocket wheel being located between said secondary variable-pitch pulley and said reduction gear means;
a second sprocket wheel fixed to said differential gear box in a plane perpendicular to the axis of rotation of said differential gear box; and
a chain extended between said first and second sprocket wheels to transmit the rotation of said first sprocket wheel to said second sprocket wheel.

4,549,448

DIFFERENTIAL LOCK CONTROL SYSTEM RESPONSIVE TO A PLURALITY OF VEHICLE PARAMETERS

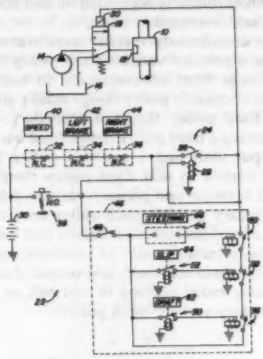
Carl E. Kittle, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jun. 13, 1983, Ser. No. 503,968
Int. Cl.[4] F16H *1/44.5*
U.S. Cl. 74—710.5 **13 Claims**

1. In a vehicle having a differential and locking means for locking and unlocking the differential, a differential lock control system comprising:
first means coupled to the locking means and responsive to a

first vehicle function and operable only to automatically unlock the differential; and

second means coupled to the locking means and responsive to at least a second vehicle function and operable only to



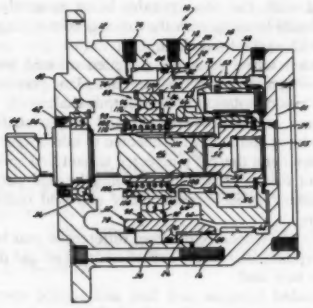
automatically lock an unlocked differential, the second means automatically causing the locking means to lock the differential in response to a predetermined condition of a steering system of the vehicle, the second means being inoperative to unlock a locked differential.

4,549,449

GEAR REDUCER

Richard W. Miller; Jay Nagao, and Steve Dexter, all of Lafayette, Ind., assignors to Fairfield Manufacturing Company, Lafayette, Ind.

Filed Oct. 11, 1983, Ser. No. 540,460
Int. Cl.[4] F16H *3/78*
U.S. Cl. 74—785 **5 Claims**



1. A plural speed gear box, comprising:

a casing having an interior cylindrical wall;

a tubular piston within said casing mounted for axial sliding motion on said cylindrical wall;

a gear shifter within said casing mounted for axial motion under the influence of said piston;

an input drive member and an output drive member journaled in said casing, wherein said gear shifter is splined to and rotates with said output member, and said piston is rotationally stationary with respect to said casing;

a reduction gear set engaged with said input drive member;

a second gear set disposed in said casing for coupling of said input drive member and said output drive member by said shifter at a gear ratio different from that of said reduction gear set;

coupling means for coupling said gear shifter and said piston to enable said piston to move said gear shifter axially between one position in which said reduction gear set is coupled with said output drive member through said shifter and a second position in which said reduction gear set is decoupled from said output drive member, and said input drive member is coupled to said output drive member through said second gear set; said coupling means including a bearing for transmitting minimal torque between said gear shifter and said piston while transmitting full axial force of said piston to said gear shifter to permit axial coupling between the rotating output member and the non-rotating piston; said coupling means further including isolator means for introducing a momentary retardation of the motion of the said shifter when said piston moves so the shifting motion of said shifter can be completed smoothly when the gear teeth of said shifter are aligned with the gear teeth on said reduction gear set or said second gear set and providing the only force to move said gear shifter so that said input member is coupled to said output member through said second gear set;

said isolator means including a spring having one end operatively engaged with said shifter and the other end operatively engaged with said piston;

said isolator means further including a ferrule coaxially surrounding a portion of said shifter and two discs, one near each end of said ferrule bearing against a shoulder on said ferrule and said shifter and urged thereagainst by said spring whereby motion of said ferrule compresses said spring between said discs to increase the spring force tending to move said shifter in the direction of motion of said ferrule;

said isolator means further including a positive mechanical connection between said piston and said shifter for a portion of the motion of said piston to provide sufficient force on said shifter to disengage it from said second gear set or said reduction gear set; and

said positive mechanical connection includes an inwardly projecting rib on said ferrule located centrally along the axial length thereof and projecting inwardly far enough to engage said discs when said ferrule has moved the distance between said rib and said discs, whereby said piston positively moves said ferrule which compresses said spring and exerts a spring force on said shifter, and then said rib engages one of said discs and establishes a positive mechanical connection between said piston and said shifter to disengage said shifter from one of said second gear sets and said reduction gear set, whereupon said piston reaches the end of its travel before said shifter engages with the other of said second gear set and said reduction gear set so that said engagement is made only under said spring force.

4,549,450

ORBITAL SPEED REDUCER WITH COMPENSATION COUPLING

Michel A. Pierrat, 5405 8th St., Charleston, Mass. 02129

Filed Feb. 25, 1982, Ser. No. 352,122
Int. Cl.[4] F16H *1/28*
U.S. Cl. 74—805 **8 Claims**

1. A speed reducer comprising

an orbitally driven rotor having a perimeter defined by a smooth curve forming a plurality of equally-spaced lobes,

a plurality of spaced rollers arranged on a circle each simultaneously engaging an outer periphery of said rotor, and

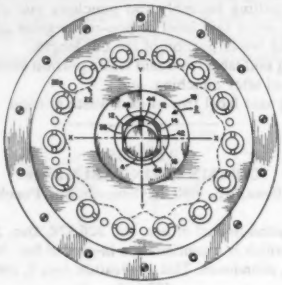
drive means for producing orbital movement of said rotor including

a drive shaft,

a rotor drive element rotatably coupled to said rotor arranged to drive said rotor along an orbital path and having a radial opening therein with spaced opposing substantially parallel faces,

a coupling element arranged to be driven by said drive shaft and having first and second drive surfaces, each of

said drive surfaces being crowned in a direction transverse to the longitudinal axis of said drive shaft,



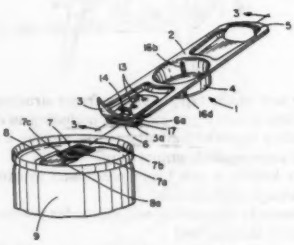
said first and second drive surfaces being respectively in slidable engagement with said opposing faces of said rotor drive element.

4,549,451

PIERCING TOOL FOR MANIPULATING THE CLOSURES OF BEVERAGE CONTAINERS

Bruno Widman, 812 Oakton, Romeoville, Ill. 60441

Filed Jan. 6, 1984, Ser. No. 568,900
Int. Cl.[4] B67B *7/00*
U.S. Cl. 81—3.47 **1 Claim**



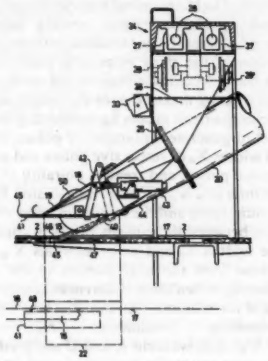
1. In a piercing tool for opening a metal container in which the tool has an elongated body which supports generally at one end of the body a curved piercing blade which is tapered relative the width of the body to terminate in a piercing point and a cooperating hook for engaging the container with the hook being disposed on the concave side of the blade, the improvement for opening additionally a container having a lid including a scored flag closure which is to be displaced into the interior of the container by a movable tab which is fixed by an intermediate anchor adjacent the flap closure with the tab including a handle portion located on one side of the tab anchor and adapted to be elevated relative the container lid and with the tab also including a closure depressing portion located on the other side of the tab anchor adjacent the flap closure, comprising an elongated bar disposed adjacent the convex side of the curved piercing blade approximately opposite the hook and supported on the piercing tool to define a tab receiving slot which when engaging the tab uses the convex surface of the piercing blade resting against the tab and the flap closure as a support defining a convex bearing surface with the bar elevating the tab and with both the tab depressing portion and the convex surface of the blade depressing the flap closure to open the container and in which the piercing blade has a curved length approximately equal to the length of the scored flap closure so as to overlie the closure for at least substantially its entire length during a container opening operation.

4,549,452

APPARATUS FOR REMOVING EDGE STRIPS CUT OFF IN LONGITUDINAL SLITTING AND GROOVING MACHINES

Lothar Jobst, Weiherhammer, Fed. Rep. of Germany, assignor to BHS-Bayerische Berg-, Hütten- und Salzwerke Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 11, 1983, Ser. No. 474,612
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1982, 8207236[U]
Int. Cl.[4] B26D *7/18*
U.S. Cl. 83—100 **11 Claims**



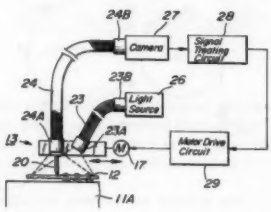
1. Apparatus for removing edge strips cut from a longitudinally movable web of material in a longitudinal web slitting and grooving machine, comprising: edge cutting tool means for each longitudinal edge of said web, frame means for supporting said edge cutting tool means for transverse movement relative to said web, suction nozzle means for each lateral edge of said web mounted on said frame means and movable therewith, and drive means for adjusting said frame means and, consequently, each said suction nozzle means transversely with respect to the longitudinal direction of said web in correspondence with the respective said edge cutting tool means for registering with and receiving the respective edge strip cut from said web.

4,549,453

APPARATUS FOR CUTTING OUT AN EDGE PORTION OF A COATING SHEET

Susumu Yazaki, Kodaira, and Jun Nagano, Higashimurayama, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Dec. 21, 1983, Ser. No. 564,102
Claims priority, application Japan, Dec. 29, 1982, 57-230060
Int. Cl.[4] B26D *5/00*
U.S. Cl. 83—365 **7 Claims**



1. In an apparatus for cutting out an edge portion of a coat-

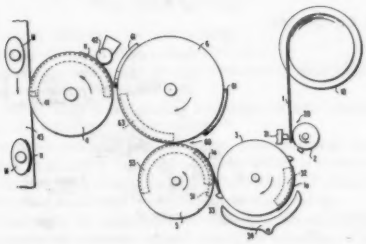
ing sheet wherein a plurality of cords arranged at substantially equal intervals and in parallel with each other and conveyed along a predetermined path are integrally coated with rubber or the like to form cord portions in such a manner that the cord portions are expanded, to a predetermined length from a most externally positioned cord portion of the coating sheet in transversal direction thereof, comprising; a cutter for cutting out an edge portion of the conveying coating sheet, projecting means having a light source and a light guide which projects light emanated from the light source onto a region including at least the most externally positioned cord portion of the coating sheet, said projection means further comprising; a photoelectric conversion means for converting the amount of intensity distribution of light emanated from an image guide into electrical output signals, and signal treating means for detecting positions of a plurality of the cord portions and for detecting the position of the most externally positioned cord portion based on the detected positions of the cord portions; wherein the signal treating means shapes the output signals of the photoelectric conversion means by comparing them with a reference level to generate a plurality of pulses, treats these pulses to obtain widths X_n of respective pulses and pulse intervals X'_n of successive pulses, and treats a plurality of pulse widths X_n and pulse intervals X'_n to obtain mean value $\overline{X}_n$ and $\overline{X}'_n$, except the maximum value and the minimum value thereof and obtain differences between these mean values $\overline{X}_n$ and $\overline{X}'_n$ and successive pulse widths X_n and pulse intervals X'_n, respectively, in the direction from the edge portion to the cord portion, in order, whereby when these differences satisfy a predetermined condition, if the relations $|X_{n+1}-\overline{X}_n|$ and $|X_{n+1}-\overline{X}'_n|$ have the following conditions, $|X_{n+1}-\overline{X}_n| \leqq \alpha$, and $|X'_{n+1}-\overline{X}'_n| \leqq \beta$, wherein α and β are predetermined tolerances, the most externally positioned cord portion is detected; detection means having the image guide which receives light projected by the projection means and reflected from the coating sheet and for detecting the position of the most externally positioned cord portion based on the intensity-distribution of the light emanated from the image guide, a head for integrally holding the cutter, an exit edge portion of the light guide and an entrance edge portion of the image guide, head translating means for moving the head in the transversal direction of the coating sheet, and means for controlling means in such a manner that the cutter is always positioned at the predetermined position to the most externally positioned cord portion of the coating sheet.

4,549,454

METHOD FOR CUTTING AND SUPPLYING LABELS OF VARIOUS SHAPES

Kyouichi Yamashita, Kanagawa, Japan, assignor to Koyo Jidoki Co., Ltd., Kanagawa, Japan

Filed Aug. 14, 1984, Ser. No. 640,622
Claims priority, application Japan, Aug. 22, 1983, 58-151596
Int. Cl.[4] B32B *31/00*; B26D *9/00*
U.S. Cl. 83—27 **4 Claims**



1. A method of cutting and supplying labels of non-rectangular shape form a tape bearing multiple labels with minimal waste during cutting, said method comprising:

severing said tape at intervals into precise lengths of cut tape generally equal in length to that of the desired label,

precisely placing each of said cut lengths of tape within a punch cutting assembly and punching said cut length of tape to sever said label of non-rectangular configuration from the waste portion of the cut length,

separating said label from said waste portion about the rim of said label after punching, and

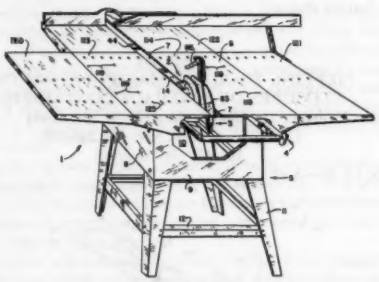
delivering said label free of said waste portion.

4,549,455

COMBINATION TABLE SAW

Milton Perilloux, Jr., 680 N. Seventh St., Ponchatoula, La. 70454

Continuation-in-part of Ser. No. 326,578, Dec. 2, 1981, abandoned, which is a continuation-in-part of Ser. No. 138,288, Apr. 8, 1980, abandoned. This application Apr. 7, 1983, Ser. No. 482,763
Int. Cl.[4] B27B *5/20*
U.S. Cl. 83—477.2 **6 Claims**



1. In a table saw of the type having a frame structure and a table top attached to said frame structure including an elongate channel extending therethrough adapted to receive a circular saw blade, the improvement comprising:

a saw motor having a saw blade positioned to extend upwardly through said channel;

a carriage assembly supporting said motor for pivotal movement relative thereto; and

a track assembly supporting said carriage assembly for slidable movement relative thereto in a direction parallel to said channel, said track assembly being mounted on said frame structure for slidable movement relative thereto in a direction parallel to said channel such that said track assembly may be displaced relative to said frame structure so that an end of said track assembly protrudes from said frame assembly, and said carriage assembly may be displaced relative to said frame assembly such that said blade is positioned sidewardly beyond said table.

4,549,456

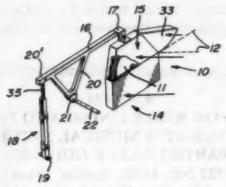
NOISE DAMPING GUARD FOR CIRCULAR SAWS

Rachik Elmaraghy, and Michel Fontaine, both of Ste-Foy, Canada, assignors to Centre de Recherche Industrielle du Quebec, Quebec, Canada

Filed Sep. 7, 1983, Ser. No. 530,063
Int. Cl.[4] B26D *1/02*
U.S. Cl. 83—478 **7 Claims**

1. A composite noise damping guard for a circular saw blade of the type mounted for axial rotation relative to a material support plane disposed transverse to the cutting axis of said blade; said guard comprising a stationary lower guard section secured beneath said support plane and a pivoted upper guard section secured above said support plane; each said guard sections being comprised by a guard frame supporting an inner pair of anti-friction brass plates secured in parallel-spaced

relationship to one another to receive a saw blade in close spacing therebetween, said brass plates being capable of withstanding the effects of blade contact when said blade vibrates, an air gap defined between each side of said blade and an inner face of said brass plates, a backing steel plate secured to said brass plates through said guard frame to maintain said brass



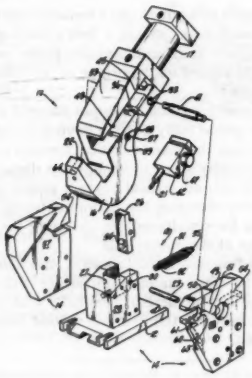
plates in alignment, a spacer plate of plastics material removably secured in flush facial contact between said brass plates and said backing plate, means to detachably secure the brass plate from the backing plates whereby said brass plates, spacer plates and backing plates are separable from one another; and a pivoting support arm secured to said guard upper section for upward displacement of said guard upper section.

4,549,457

TIP IN EQUALIZING APPARATUS

Alf L. Bloch, Pleasant Ridge, and Joseph H. Tindall, Rochester, both of Mich., assignors to West Industries, Inc., Troy, Mich.

Filed Apr. 25, 1983, Ser. No. 488,336
Int. Cl.[4] B26F *1/02*
U.S. Cl. 83—582 **15 Claims**



1. An apparatus for performing operations on a workpiece, comprising:

a frame adapted to be secured to a mounting surface;

an arm having an anvil and a tool mounted for reciprocal movement on said arm relative to said anvil;

cam and follower means for guiding the movement of said arm in one plane relative to the frame;

power means operatively connected to said tool for reciprocating said tool relative to said workpiece;

a biasing member interconnected with said frame;

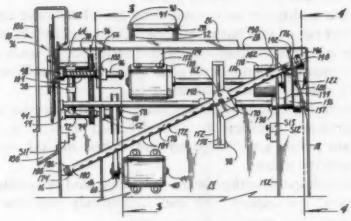
lever means having a first end engaging said biasing member and a second end engaging said arm for pivotably transferring pressure applied to said first end by said biasing member to said arm thereby equalizing the force applied by said tool and said anvil upon opposite sides of a workpiece while performing operations on the workpiece.

4,549,458

METHOD AND MEANS OF APPORTIONING AND CUTTING MEAT

Ray T. Townsend, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Filed Dec. 5, 1983, Ser. No. 557,967
Int. Cl.[4] B26D *7/06*
U.S. Cl. 83—42 **18 Claims**



1. A method of apportioning and cutting a loaf of meat having opposite ends defining and substantially parallel planes into a plurality of slices of substantially equal thickness, comprising:

intersecting each of said planes with one of a plurality of equally spaced linear calibrations whereby the calibrations between said parallel planes automatically apportion said loaf into slices of substantially equal thickness,

periodically cutting successive slices from one end of said loaf, and

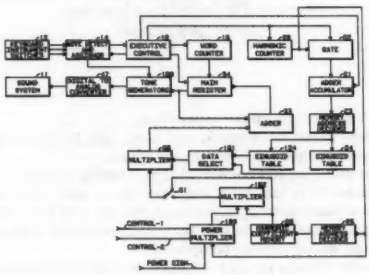
advancing said loaf a distance equal to the thickness of the slice to be cut after each slice is cut from said one end of said loaf.

4,549,459

INTEGRAL AND A DIFFERENTIAL WAVESHAPE GENERATOR FOR AN ELECTRONIC MUSICAL INSTRUMENT

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

Filed Apr. 6, 1984, Ser. No. 597,316
Int. Cl.[4] G10H *1/06, 7/00*
U.S. Cl. 84—1.01 **11 Claims**



1. In combination with a musical instrument in which musical waveshape data points are computed during each one of a sequence of computation cycles from a set of harmonic coefficients, apparatus for producing derived musical tones comprising;

a harmonic coefficient memory for storing said set of harmonic coefficients,

a memory address generating means for generating a sequence of memory address numbers,

a memory addressing means for reading out a harmonic

coefficient from said harmonic coefficient memory in response to each one of said sequence of memory address numbers,

a control signal generator wherein a scale control signal is generated in response to a preselected order signal,

a power multiplier means whereby a sequence of scale numbers are created each of which has a numerical magnitude corresponding to an associated one of said sequence of memory address numbers raised to a power associated with said scale control signal,

a scale multiplier means whereby each harmonic coefficient read out of said harmonic coefficient memory is multiplied by a corresponding one of said sequence of scale numbers to create a sequence of scaled harmonic coefficients,

a waveshape memory means,

a means for computing responsive to said sequence of scaled harmonic coefficients whereby said musical waveshape data points are computed and stored in said waveshape memory means,

a waveshape reading means whereby said waveshape data points are sequentially and repetitively read out of said waveshape memory means, and

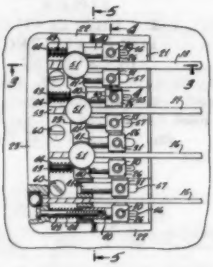
a means for producing musical tones responsive to waveshape data points read out from said waveshape memory means whereby said derived musical tones are produced.

4,549,460

ELECTRIC BASS GUITAR INCORPORATING FINE-TUNING AND STRING LENGTH-ADJUSTING MEANS

Charles A. Gressett, Jr., Brea, and Daniel J. Smith, La Habra, both of Calif., assignors to Fender Musical Instruments Corporation, Brea, Calif.

Filed May 6, 1983, Ser. No. 492,258
Int. Cl.[4] G10D *3/14*
U.S. Cl. 84—298 **6 Claims**



1. An electric bass guitar, comprising:

(a) a bass guitar body, neck, and head, said head having a tuning machine thereon for each string,

(b) bass guitar strings connected to said tuning machines and extended over said head and a portion of said body, and

(c) a combination string-adjustment, bridge, and fine-tuning apparatus mounted on said body and associated with said strings, said apparatus comprising

a saddle element for each of said strings and serving as the bridge therefor,

means to adjust each of said saddle elements longitudinally of said strings,

means to adjust each of said saddle elements upwardly and downwardly relative to the face of the guitar body to thus determine the heights of the strings over the body and over the neck,

means to anchor said strings at regions disposed on the opposite sides of said saddle elements from said head, and

fine-tuning means disposed on the opposite sides of said bridge elements from said head, and between said bridge elements and said anchor means, to bear laterally against the portions of said strings between said saddle elements and said anchor means and thereby change the string tensions and thus the pitches of said strings,

said fine-tuning means being fine-tuning screws that bear against said portions of said strings,

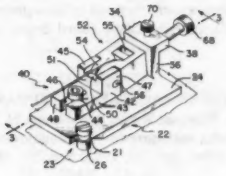
said portions of said strings being wrapped, whereby to provide seats for said screws and to prevent or minimize damage to said strings by said screws despite the major pressures involved in the fine-tuning operations.

4,549,461

APPARATUS FOR RESTRAINING AND FINE TUNING THE STRINGS OF A MUSICAL INSTRUMENT, PARTICULARLY GUITARS

Floyd D. Rose, 2727 NE. 145th, Seattle, Wash. 98155

Continuation of Ser. No. 358,169, Mar. 15, 1982,. This application Feb. 4, 1985, Ser. No. 697,837
The portion of the term of this patent subsequent to Feb. 5, 2002, has been disclaimed.
Int. Cl.[4] G10D *3/14*
U.S. Cl. 84—313 **3 Claims**



1. A combination of a guitar and a tremolo and tuning apparatus, wherein each string makes a first critical contact with the guitar at a point on the nut of the guitar and a second critical contact at a point on the bridge of the guitar, the combination comprising:

a guitar comprising a guitar body portion and a guitar neck portion, the guitar body portion having a bridge thereon;

means for moving the second critical contact point of each string individually so as to change the distance between the first and second critical contact points of said each string, thereby changing the harmonic tuning thereof;

tremolo means for simultaneously changing the pitch of all of the strings of the guitar; and

means mounted on said tremolo means, and hence movable therewith, for fine tuning each string individually by changing the tension thereof, essentially without changing the distance between the first and second critical contact points thereof.

4,549,462

APPARATUS AND METHOD FOR MOUNTING A HEAD ON A MUSICAL INSTRUMENT AND A METHOD OF DRUM CONSTRUCTION

Donald R. Hartry, La Canada, and Remo D. Belli, Sherman Oaks, both of Calif., assignors to Remo, Inc., North Hollywood, Calif.

Continuation-in-part of Ser. No. 250,912, Apr. 3, 1981, Pat. No. 4,416,181. This application Sep. 8, 1982, Ser. No. 416,069
Int. Cl.[4] G10D *13/02*
U.S. Cl. 84—413 **22 Claims**

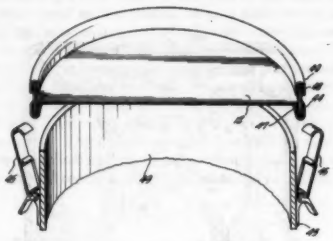
1. An apparatus for mounting a head on musical instrument comprising:

(a) a first annular hoop having a channel formed along the edge thereof;

(b) a polymeric film which is stretched across the opening in the annular hoop;

(c) an annular plug member which is inserted into the chan-

nel formed along the edge of the first annular hoop such that the polymeric film is shaped and stretched as it is forced into the channel by one rim of the plug member to contact an adhesive therein and such that the opposite rim of the plug member extends above the edges of the channel;



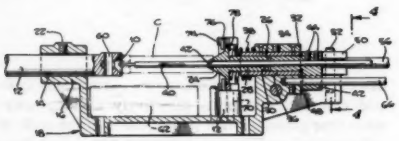
(d) a second annular hoop having a channel formed along the edge thereof substantially identical to the first annular hoop, and disposed in complementary fashion to the first annular member so that the channel covers the opposite rim of the plug member to form a drumhead assembly.

4,549,463

DECAPPING TOOL

Antti P. Raiha, 8425 Sunnyside Rd., Sandpoint, Id. 83864

Filed Jan. 5, 1984, Ser. No. 568,345
Int. Cl.⁴ F42B *33/10*
U.S. Cl. 86—36 **5 Claims**



1. In a decapping tool for a center fire cartridge having a base, a neck and a flash port:

(a) a tool body;

(b) a pair of cartridge holders;

(c) one of said cartridge holders providing a substantially conical concave seat adapted to engage the peripheral edges of the cartridge base, and the other of said cartridge holders providing a substantially convex conical center adapted to enter the cartridge neck to engage the edges thereof;

(d) means mounting said holders in coaxial relationship on said tool body and providing a degree of freedom of one of said holders for movement towards and away from the other of said holders;

(e) means biasing said holders for movement towards each other so that a cartridge inserted between said holders is held and centered thereby, the actual annular areas of said concave seat and convex center engaged by the edges of said cartridge base and the edges of said cartridge neck being determined by the sizes of said edges, whereby said holders accommodate and center said cartridge despite variations in length and caliber;

(f) a decapping punch rod guided directly or indirectly by said tool body independently of said cartridge for axial movement through said center to the region of the flash port of the cartridge; and

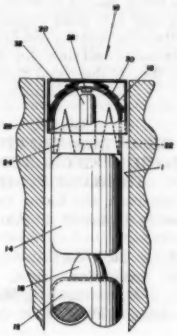
(g) a crank mechanism for moving said punch rod through said flash port for decapping said cartridge.

4,549,464

INFLATABLE, AERODYNAMIC SHROUD

David K. Hawkins, Brigham City, and Donald R. Sauvageau, North Ogden, both of Utah, assignors to Morton Thiokol, Inc., Chicago, Ill.

Filed Feb. 23, 1984, Ser. No. 582,972
Int. Cl.⁴ F41F *3/04*
U.S. Cl. 89—1.809 **12 Claims**



1. Apparatus for use on an elongated aerodynamic structure having a stored mode and an operational mode and including a nose cone at a forward portion thereof comprising,

a flexible inflatable shroud which in stowed position is folded against the nose cone whereby the aerodynamic structure in the stored mode thereof is allowed to occupy substantially all of the available packaging length, said inflatable shroud in an inflated position extending away from the aerodynamic structure forward of the nose cone to provide a desired aerodynamic shape to reduce drag and improve performance, and

means to inflate the inflatable shroud to said inflated position when the aerodynamic structure is deployed into the operational mode thereof.

4,549,465

SLIDE STOP PLATE ASSEMBLY FOR A HANDGUN

Dwayne Charron, Springfield, Mass., assignor to Bangor Punta Corporation, Greenwich, Conn.

Filed Jan. 6, 1984, Ser. No. 568,763
Int. Cl.⁴ F41C *3/00*
U.S. Cl. 89—196 **7 Claims**

1. For use in a handgun having a frame, a slide carried by the frame for movement between firing and recoil positions, and a hammer, a slide stop assembly comprising:

a slide stop carried by said frame for movement between a first position permitting free movement of the slide relative to the frame between its firing and recoil positions and a second position engageable with the slide in its recoil position to retain the slide in such latter position;

an elongated side plate for securement along one side of the frame and having elongated leg portions forming an apex at their junction intermediate the ends of said side plate,

a pin secured to and extending laterally from the apex of said side plate into the frame to secure the side plate to the frame and serve as the pivot pin for the hammer, and

means for securing one leg of said side plate to the frame whereby said pin and said securing means secure said side plate to said frame against rotation, an end portion of the other leg of said side plate engaging said slide stop to releasably retain the latter in said first position thereof and enable movement of said slide stop into its second position retaining the slide in the recoil position.

4,549,466

SPLIT TYPE OIL HYDRAULIC PISTON PUMP AND PRESSURIZED OIL FEED CIRCUIT MAKING USE OF THE SAME PUMP

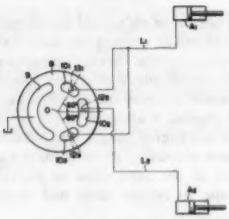
Kenzo Hoashi, Yokohama, and Kazuo Uehara, Tokyo, both of Japan, assignors to kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Apr. 26, 1984, Ser. No. 604,106

Claims priority, application Japan, Apr. 27, 1983, 58-62093[U]; May 31, 1983, 58-81045[U]; May 31, 1983, 58-94882

Int. Cl.⁴ F04B *27/06, 1/22*

U.S. Cl. 91—6.5 **2 Claims**



1. In a split type oil hydraulic piston pump including a plurality of piston-cylinder units disposed within a single cylinder block along a circumference thereof at equal angular intervals and in parallel with each other, and a valve plate disposed on the pressurized oil suction/delivery side of these piston units so as to make slidable contact with said cylinder block, the improvement comprising providing said valve plate with a single suction slot and a plurality of delivery slots, said plurality of delivery slots being disposed along said circumference spaced by an angular interval of 60° from each other, said valve plate being further provided with outlet slots serving as additional delivery slots between adjacent delivery slots of said plurality of delivery slots, and wherein said plurality of piston-cylinder units is a number as high as a multiple of 6.

4,549,467

ACTUATOR VALVE

James K. Wilden, Yucaipa, and Alan D. Tuck, Upland, both of Calif., assignors to Wilden Pump & Engineering Co., Colton, Calif.

Filed Aug. 3, 1983, Ser. No. 519,988

Int. Cl.⁴ F01L *25/06*

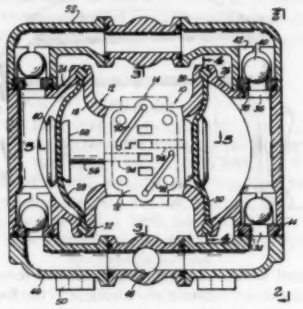
U.S. Cl. 91—307 **4 Claims**

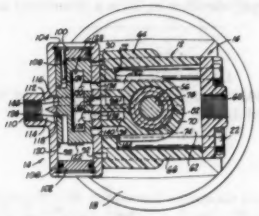
1. An actuator valve for an air driven reciprocating device, in combination comprising

a valve piston having a single transverse passage;

a control rod fixed to reciprocate with the air driven reciprocating device;

a housing having a cylinder closed at each end and enclosing said valve piston, a passageway through which said control rod extends, an air inlet to said cylinder spaced from the ends of said cylinder, valve piston vent passages extending from said cylinder to said passageway, and control rod vent passage means for venting said passageway extending from said passageway to atmosphere, said valve piston cooperating with said housing tc include means for directing incoming air to the ends of said valve piston and means for selectively directing incoming air to and exhausting outgoing air from the air driven reciprocating





device, said air inlet including two ports axially spaced at said cylinder, said ports selectively aligning with said transverse passage when said piston is at the ends of said cylinder and said control rod including at least one axial passage in said control rod to cooperate with said valve piston vent passages and said control rod vent passage means.

4,549,468

HYDRAULIC CONTROL DEVICE, PARTICULARLY FOR POWER STEERING

Christian Tristignac, Nogent sur Marne, and Jean-Claude Jaccod, Champigny, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Feb. 1, 1984, Ser. No. 575,987

Claims priority, application France, Feb. 1, 1983, 83 01522

Int. Cl.⁴ F01B *25/26*

U.S. Cl. 91—361 **2 Claims**

1. A hydraulic control device for a power steering system comprising:

(a) a manually rotatable steering shaft;

(b) a double-action hydraulic jack comprising a cylinder, a piston slidably disposed in said cylinder so as to divide said cylinder into a first chamber and a second chamber, and a rod extending from said piston through said chambers, one end of said rod being operatively connected to said steering shaft to convert rotary motion of said steering shaft into linear motion of said rod;

(c) a torque sensor operatively connected to said steering shaft to sense torque applied manually thereto;

(d) a constant-flow pump;

(e) a first path of fluid communication leading from said constant-flow pump to said first chamber; and

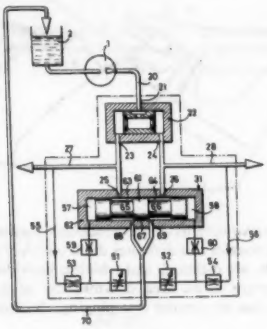
(f) a second path of fluid communication leading from said constant-flow pump to said second chamber,

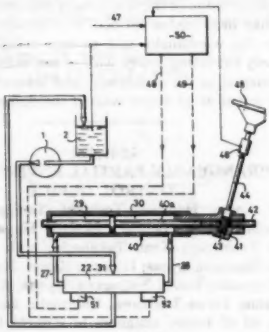
said hydraulic control device comprising:

(g) an electrohydraulic distributor valve comprising:

(i) a body having a bore therein and

(ii) a slide valve slidably disposed in said bore, said slide valve having a first land at a first end of said slide valve, a second land in the middle of said slide valve, and a third land at a second end of said slide valve opposite to the first end thereof, said first and second lands being separated by a first annular groove and said second and third lands being separated by a second annular groove, said slide valve being shorter than said bore, whereby said bore is divided into a first control chamber fluid pressure in which acts on said first end of said slide valve, a second control chamber fluid pressure in which acts on said second end of said slide valve, a first annular valve chamber between said first and second lands, and a second annular valve chamber between said second and third lands;





(h) a third path of fluid communication leading from said first path of fluid communication to said first annular valve chamber, said third path of fluid communication communicating with said first annular valve chamber at a point which ensures unobstructed communication over the entire range of movement of said slide valve;

(i) a fourth path of fluid communication leading from said second path of fluid communication to said second annular valve chamber, said fourth path of fluid communication communicating with said second annular valve chamber at a point which ensures unobstructed communication over the entire range of movement of said slide valve;

(j) a fifth path of fluid communication leading from said first annular valve chamber to tank, said fifth path of fluid communication communicating with said first annular valve chamber at a point such that communication is unobstructed when said slide valve is in its null position and when said slide valve moves from its null position in a first direction but is progressively throttled when said slide valve moves from its null position in a second direction opposite to said first direction;

(k) a sixth path of fluid communication leading from said second annular valve chamber to tank, said sixth path of fluid communication communicating with said second annular valve chamber at a point such that communication is unobstructed when said slide valve is in its null position and when said slide valve moves from its null position in said second direction but is progressively throttled when said slide valve moves from its null position in said first direction;

(l) a seventh path of fluid communication communicating control pressure which is a function of the pressure in said first path of fluid communication to said first control chamber;

(m) an eighth path of fluid communication communicating control pressure which is a function of the pressure in said second path of fluid communication to said second control chamber;

(n) a ninth path of fluid communication containing a first variable orifice communicating said seventh path of fluid communication to tank;

(o) a tenth path of fluid communication containing a second variable orifice communicating said eighth path of fluid communication to tank;

(p) a performance sensor; and

(q) an electronic processing control, said electronic processing control having inputs from said torque sensor and said performance sensor and outputs to said first and second variable orifices,

whereby:

(r) when said first and second variable orifices are closed, said slide valve is maintained in its null position by balanced control pressures in said first and second control chambers, said third and fifth paths of fluid communication are unobstructedly communicated to tank through said first annular valve chamber, and said fourth and sixth paths of fluid communication are unobstructedly communicated to tank through said second annular valve chamber;

(s) when said first variable orifice is opened while said second variable orifice remains closed, the control pressure in said first control chamber is reduced, causing the control pressure in said second control chamber to move said valve slide in said second direction, throttling said fifth path of fluid communication and thereby boosting pressure in said first chamber; and

(t) when said second variable orifice is opened while said first variable orifice remains closed, the control pressure in said second control chamber is reduced, causing the control pressure in said first control chamber to move said valve slide in said first direction, throttling said sixth path of fluid communication and thereby boosting the pressure in said second chamber.

4,549,469

HYDRAULIC RAM

Karl-Heinz Piester; Klaus-Dieter Reddig, both of Lunen, and Heinz Hessel, Flaesheim, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Nov. 3, 1983, Ser. No. 548,405

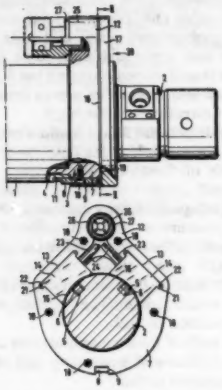
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1982, 3241237

Int. Cl.[4] F01B *31/12*

U.S. Cl. 92—5 R **14 Claims**

1. A hydraulic ram having a piston rod reciprocable relative to a cylinder, the piston rod projecting through one end of the cylinder and being provided with at least one permanent mag-

net, and the cylinder being provided with at least one sensor, wherein said at least one sensor is accommodated in a respective pocket formed in the cylinder, said pocket having a first opening facing in a first direction towards said piston rod and a second opening facing in a second direction parallel to the cylinder axis and through which said sensor is removably received, said pocket and said sensor having complimentary



slidably engageable forms which serve both to guide the thus received sensor in said second direction into and out of a predetermined position in said pocket relative to the piston rod and to prevent said sensor from being withdrawn in said first direction from said predetermined position through said first opening, and wherein said second opening is closed off by a detachable closure member.

4,549,470

PNEUMATIC ACTUATOR

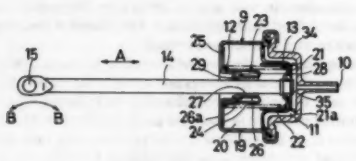
Kenji Yogo, Nagoya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Filed Jun. 29, 1984, Ser. No. 626,262

Claims priority, application Japan, Jun. 29, 1983, 58-099449

Int. Cl.⁴ F01B *19/00*; F16J *3/02*

U.S. Cl. 92—94 **5 Claims**



1. A pneumatic actuator comprising hollow housing means, diaphragm means dividing said housing means into first and second chambers, a port formed in said housing means in communication with said first chamber, an aperture formed in said housing member in communication with said second chamber, coil spring means disposed in said second chamber for biasing said diaphragm towards said first chamber, rod means connected to said diaphragm and extending outwardly through said aperture, bearing means for supporting said rod for reciprocating movement relative thereto and leaf spring means mounted in said second chamber for moveably supporting said bearing means adjacent said aperture, said leaf spring means having a reversely bent portion for supporting an outer surface of said bearing means and a flange portion interposed between said coil spring means and said housing means to hold said leaf spring means adjacent an inner wall of said housing means.

4,549,471

DEFROSTER SYSTEM FOR USE IN MOTOR VEHICLES

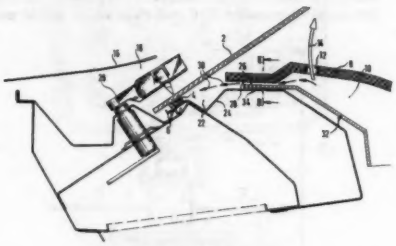
Fritz B. Kochy, Mainz, and Hermann Bayer, Russelsheim, both of Fed. Rep. of Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 22, 1984, Ser. No. 663,352

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1983, 3339892

Int. Cl.⁴ B60H *1/00*

U.S. Cl. 98—2.09 **1 Claim**



1. Motor vehicle having a windshield against which hot air discharge nozzles of a defroster duct, which are disposed inside the vehicle, are directed, and which is provided with auxiliary heating means in an area downwardly of that area against which the hot air current is impinging, the improvement comprising:

the auxiliary heating being effected by secondary air ducts which extend from the defroster duct into the vicinity of the lower edge of the windshield and are defined by channel-like depressions formed in a surface disposed proximate the windshield, said surface being part of a transversely extending lower wall of the defroster duct which is fastened to the dashboard, and wherein the dashboard also serves as an upper wall of the defroster duct.

4,549,472

REARRANGEABLE PARTIAL ENVIRONMENTAL CONTROL DEVICE

Mitsushi Endo, Hadano; Toshiaki Taniguchi, Hiratsuka; Teruyoshi Sahara, Hadano; Noriyuki Hayakawa, Odawara; Tatsuo Yoshitomi; Kozo Takahashi, both of Niigata; Yoshiteru Nagatani, Iruma; Hidenao Kawai, Noda; Shuichi Kaizyo, Chigasaki; Yoichi Nakagawa, Gyoda; Kazuo Yamagami, Yokohama; Teruo Takizawa, Chigasaki, and Tomio Suzuki, Tokyo, all of Japan, assignors to Hitachi Ltd. and Hitachi Plant Engineering & Construction Co., both of Tokyo, Japan

Filed Feb. 15, 1984, Ser. No. 580,387

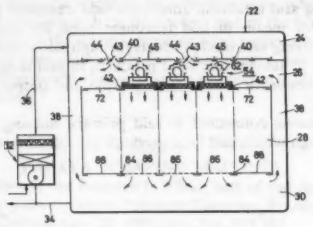
Claims priority, application Japan, Sep. 29, 1983, 58-181345

Int. Cl.⁴ F24F *7/06*

U.S. Cl. 98—34.6 **5 Claims**

1. A rearrangeable partial environmental control device wherein a room is divided into a supply chamber connected to a air conditioner, a mixing chamber, an environmental control chamber and a return chamber, which is connected to said mixing chamber, from one side to the opposite side of said room, said control device comprising in combination a first lattice with spaces arranged between said supply chamber and said mixing chamber, a second lattice with spaces arranged between said mixing chamber and said environmental control chamber, a third lattice with spaces arranged between said environmental control chamber and said return chamber, ventilating units removably installed in a number of said spaces of said second lattice, lids removably mounted in remaining spaces of said second lattice, absorbing boards removably

provided in a number of spaces of said third lattice to absorb air from said environmental control chamber into said return chamber and lids removably mounted in remaining spaces of said third lattice, conditioned air from said supply chamber and



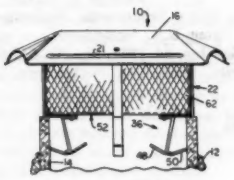
circulating air from said return chamber being mixed in said mixing chamber and air from said ventilating units being blown to predetermined positions of said environmental control chamber.

4,549,473

CHIMNEY CAP

Robert L. Alexander, Covington, Ky.; Richard C. Getoor, Madeira, Ohio, and Dennis J. Reinersman, Highland Heights, Ky., assignors to American Building Components Company, Cincinnati, Ohio

Filed Jun. 25, 1984, Ser. No. 624,475
Int. Cl.⁴ F23J *13/08*
U.S. Cl. 98—67 **4 Claims**



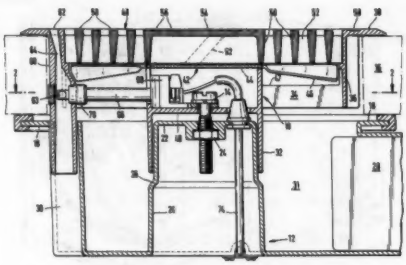
1. A chimney cap which comprises a roof panel, hanger members mounted on the underside of the roof panel and extending downwardly from the roof panel, each of the hanger members including a body and a horizontal flange mounted on the body and extending inwardly of the roof panel from a lower end of the body of the hanger member, an anchor member mounted on each of the hanger members, the anchor member including a horizontal flange in flatwise relation with the horizontal flange of the associated hanger member, an upright shank extending downwardly from the anchor member horizontal flange, and a fluke arm extending upwardly and outwardly of the shank, and a perforated cage member mounted under the roof panel and inside the hanger members and overlying and engageable by the horizontal flanges of the hanger members to resist upward bending of the hanger member horizontal flange when the fluke arm is in stressed engagement with the interior of a flue liner of a chimney to hold the chimney cap on the chimney.

4,549,474

AIR CONDITIONER OUTLET

Michael Fey, Hilden; Wolfgang Finkelstein; Josef Haaz, both of Neukirchen-Vluyn, and Hans Riegel, Geldern, all of Fed. Rep. of Germany, assignors to Gebruder Trox Gesellschaft mit beschrankter Haftung, Neukirchen-Vluyn, Fed. Rep. of Germany

Filed Jun. 8, 1984, Ser. No. 618,501
Claims priority, application United Kingdom, Jun. 8, 1983, 8315688
Int. Cl.⁴ F24F *13/08*
U.S. Cl. 98—120 **16 Claims**



1. A floor-mounted outlet for an air conditioner or ventilator, comprising:

a circular grill adapted to be received in a circular floor opening and provided with a plurality of radially spaced mutually concentric ring elements;

means for feeding air to said grill from below; and

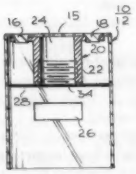
a baffle disposed between said means and said ring elements for imparting a vortex movement to air rising through said grill about a substantially vertical axis perpendicular to said grill and surrounded by said elements, said baffle being provided with a central disc and a multiplicity of angularly equispaced radially extended blades twisted out of the plane of said disc and projecting therefrom, said elements being interconnected by radial ribs inclined to the vertical with substantially the same inclination as said blades are inclined with the vertical.

4,549,475

VENTING DEVICE FOR GAS-CARRYING SYSTEMS

Hal D. Snyder, 224 N. Enrose, San Pedro, Calif. 90732

Filed Oct. 5, 1984, Ser. No. 658,203
Int. Cl.⁴ B65D *51/16*
U.S. Cl. 98—122 **10 Claims**



1. A vent for controlled venting of excess gas in a gas distribution system, including:

a case having a wall with first and second ends;

a cap carried by said first end;

a hub carried by said cap internally of said case;

said hub having a stem, said stem being directed away from said cap, having internal threads for receiving the external threads of an exhaust pipe and having an exhaust orifice in one sector thereof;

said case having a venting orifice in the wall thereof for venting gas from said exhaust orifice;

said exhaust orifice and said venting orifice being azimuthally aligned.

4,549,476

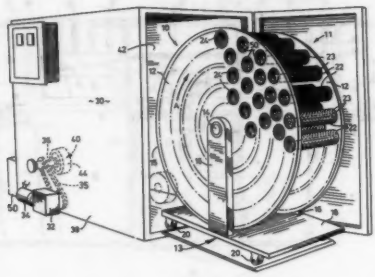
SMOKE HOUSE COOKING

Jacobus J. Langen, 10 Ringway Crs., Rexdale, Ontario, Canada

Filed Jan. 10, 1984, Ser. No. 569,617

Int. Cl.[4] A47J *37/04*

U.S. Cl. 99—352 **3 Claims**



1. In a smokehouse having a cooking chamber formed therein, the improvement of;

(a) a meat support adapted to fit within said chamber comprising;

(I) a rotor having a plurality of horizontally extending pockets, each proportioned to receive and support a longitudinally elongated meat product with its longitudinal extent horizontally oriented, said rotor comprising a pair of oppositely disposed end members and a plurality of transversely extending support members, said transversely extending support members extending between said end members, said support members being arranged at fixed radially spaced intervals and at fixed circumferentially spaced intervals about said end members, one of said pockets being formed in each of said transverse support members, at least one of said end members having a peripheral driving edge extending thereabout;

(II) support means supporting said rotor for rotation about a horizontal axis such that rotation of the rotor will cause rotation of the meat product stored therein with respect to the smoke house environment thereby to retain moisture in the meat product and maintain a uniform moisture distribution within the meat product as they are cooked,

(b) drive motor means located external of said cooking chamber,

(c) a drive wheel located in said cooking chamber, said drive wheel being arranged to engage said peripheral driving edge of said end member when said rotor is operably located in said housing,

(d) power transmission means extending from said drive motor to said drive wheel located in said housing to rotatably drive said drive wheel and thereby drive said rotor when said drive motor means is activated.

4,549,477

OZONE TREATMENT SYSTEM FOR FOOD

Barkman C. McCabe, Jr., P.O. Box 26, Holtville, Calif. 92250

Filed Sep. 10, 1984, Ser. No. 648,501

Int. Cl.[4] A23B *7/14*

U.S. Cl. 99—477 **18 Claims**

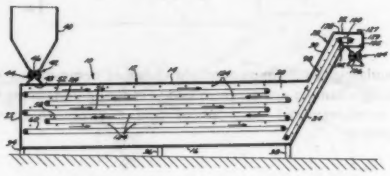
1. Apparatus for the continuous process treatment of food products with ozone gas, which comprises:

substantially closed primary housing structure defining an ozone treatment zone;

a source of supply of a treatment gas comprising ozone that is substantially more dense than oxygen connected to said primary housing structure for substantially completely filling said treatment zone with said treatment gas;

conveyor means in said treatment zone for continuously conveying said food products through said treatment zone so as to subject said food products to said treatment gas, said conveyor means having input and output end portions;

input means connected to said primary housing structure through which said food products are introduced into said



primary housing structure and onto said input end portion of said conveyor means;

output means connected to said primary housing structure for transporting treated food products from said output end portion of said conveyor means and out of the apparatus; and

means for continuously removing oxygen that is a by-product of the product treatment from said treatment zone, said removing means comprising secondary housing structure connected to said primary housing structure and defining a gravity separation zone located above and in communication with said treatment zone and into which said by-product oxygen rises by floating above the more dense treatment gas.

4,549,478

APPARATUS FOR WASHING SLICES OF A TUBEROUS PLANT

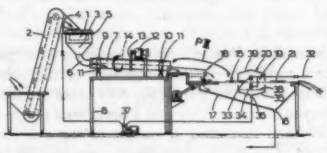
Peter C. Entes, Noord Scharwoude, Netherlands, assignor to Smiths Food Group B.V., Netherlands

Filed Jun. 14, 1984, Ser. No. 620,683

Claims priority, application Netherlands, Jun. 16, 1983, 8302149

Int. Cl.[4] A23N *15/00*

U.S. Cl. 99—536 **10 Claims**



1. Apparatus for washing slices of a tuberous plant, in particular potatoes, discharged by a slicer, said apparatus comprising a pre-washing unit with water inlet, the slicer being accommodated in said pre-washing unit, an elongated, rotatably supported washing tube connected to the pre-washing unit, a vibrating sieve having first, second and third vibrating sieve sections, following the washing tube for conveying the slices, and a receiving tank with an outlet, said vibrating sieve being mounted above the receiving tank, the first vibrating sieve section being adapted to separate shreds from the slices and consisting of a first and second part, and a water receiving bin, said first part having a portion joined to said washing tube, said

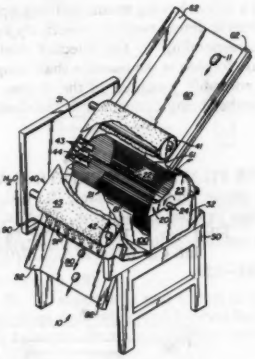
second part being disposed at a lower level than said first part, said second part including a closed plate joining said first part, said water receiving bin being mounted under the first part, said water receiving bin being closed at its upper side by a fine sieve plate and having a plurality of discharge tubes regularly distributed along the width of the vibrating sieve, wherein said discharge tubes debouch on the second part of the first vibrating sieve section, the second vibrating sieve section comprising a re-washing unit connectable to a water supply, and the third vibrating sieve section being adapted to remove surface water from the slices.

4,549,479

PAPAYA SCRAPING MACHINE

Elton H. Harter, and Federico F. Villar, both of San Jose, Costa Rica, assignors to Gerber Products Company, Fremont, Mich.

Filed Apr. 18, 1983, Ser. No. 485,932
Int. Cl.[4] A23N *7/00*
U.S. Cl. 99—625 **9 Claims**



1. Apparatus for peeling papaya, said apparatus comprising:

scraper means comprising a rotatable drum defined by a plurality of parallel straight rods interconnected equi-distant from a substantially horizontal axis;

conveyor means comprising a supply axle at a higher elevation than said drum, a take-up axle, and a conveyor belt disposed around said axles, said axles being disposed parallel to said rods, being spaced apart at relative heights to provide a conveyor belt path including an inclined path portion radially spaced from said drum with a closest approach at a position past top dead center of said drum, and being rotatable to move said conveyor belt downwardly along said inclined path portion;

feed means comprising a first slide plate above said drum, having a planar area inclined downwardly to a first edge below and parallel to said supply axle, said first edge being at a position before top dead center of said drum;

pulp collecting means disposed beneath said drum;

discharge means comprising a second slide plate having a planar area inclined downwardly from a second edge below and parallel to the closest approach of said rods to said conveyor belt, said second edge being at a position past top dead center of said drum; and

drive means for effecting rotation of said drum and said supply and take-up axles in the same angular sense such that at any instant the velocity of the rod closest to said conveyor belt is in the same direction as and greater than the velocity of said conveyor belt;

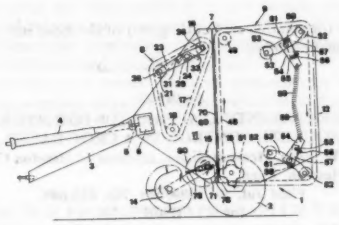
said drum, said conveyor belt, said first and second slide plates, and said pulp collecting means being relatively disposed so that papaya slices placed on said first slide plate move spontaneously downwardly, are biased against said drum by said conveyor belt, and have their pulp and seeds separated from their skins, whereupon the pulp and seeds are collected by said pulp collecting means and the skins are directed away from said pulp collecting means by said second slide plate.

4,549,480

ROUND BALER WITH EXPANDING BALE CHAMBER

Frans J. G. C. DeCoene, Zedelgem, Belgium, assignor to Sperry Corporation, New Holland, Pa.

Filed Mar. 27, 1984, Ser. No. 594,003
Claims priority, application United Kingdom, Mar. 29, 1983, 8308564
Int. Cl.[4] B30B *5/06*
U.S. Cl. 100—88 **7 Claims**



1. In a round baler having a base frame, side walls attached to said base frame, bale forming means arranged to define together with said side walls an expandable bale chamber, said bale forming means including first and second endless flexible members each defining an envelope and having an inner course that expands around and contacts a portion of a bale during formation thereof in said bale chamber, said first and second endless flexible members each extending around a plurality of associated drive and guide members mounted on said side walls, all of said associated drive and guide members being disposed within the envelopes defined by said endless flexible members, the improvement comprising:

said inner course of each of said endless flexible members being engaged with all of its associated drive and guide members when said bale chamber expands to its maximum extent; and

said first endless flexible member being disposed in a substantially triangular configuration and said second endless flexible member being disposed in a substantially rectangular configuration prior to formation of a bale in said bale chamber so that, at the completion of said formation of a bale, the major portion of the bale is encompassed by the inner course of said second endless flexible member.

4,549,481

APPARATUS TO SLICE A LARGE ROUND BALE

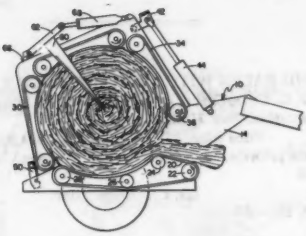
Wilbur E. Groeneveld; Leroy Kluver, both of Celina, and Michael T. Vincent, Sidney, all of Ohio, assignors to New Idea Corporation, Coldwater, Ohio

Filed Jul. 15, 1983, Ser. No. 513,648
Int. Cl.[4] B30B *9/00, 5/04*
U.S. Cl. 100—98 R **3 Claims**

1. A slicing means for a round baler having a baling chamber defined by a peripheral frame member joined to spaced-apart sidewalls defining the length of said chamber and a bale contained in said chamber, and said baler also having means for rotating a bale contained within the baling chamber about an axis, the improvement comprising:

a knife mounted on the baler and adapted to be moved into said chamber intermediate said sidewalls so that the knife will slice into a bale contained in said chamber while said bale rotates about said axis, said knife is pivotally secured

to the baler at its butt end, said knife also being secured to a hydraulic cylinder also mounted to the baler, said cylinder for rotating said cutting end of the knife into and out of said chamber.

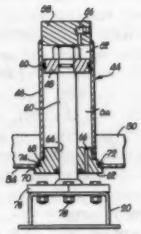


4,549,482

CYLINDER MOUNTING APPARATUS FOR HYDRAULIC SQUEEZE CONTROL IN A CROP BALER

Edward W. Esau, Hesston, Kans., assignor to Hesston Corporation, Hesston, Kans.

Filed Jul. 30, 1984, Ser. No. 635,648
Int. Cl.[4] B30B *9/30*
U.S. Cl. 100—191 **7 Claims**



1. In a bale squeezing apparatus for the discharge end of an extrusion-type crop baler, the improvement comprising:

at least one transversely movable squeeze plate for enlarging or reducing the dimensions of the discharge opening of the bale case;

a fluid pressure piston and cylinder assembly for effecting said transverse movement of the plate,

said piston of the assembly having a rod provided with an outer end secured to said plate;

a support for the assembly; and means for attaching the cylinder of said assembly to the support,

said attaching means including:

an aperture in said support adapted to receive the cylinder,

a shoulder on said cylinder disposed to limit the extent of insertion of the latter into said aperture, and

a keeper attachable to the cylinder on the opposite side of the support from said shoulder for preventing withdrawal of the cylinder from said aperture.

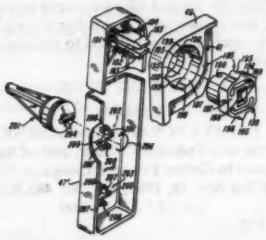
4,549,483

PRINTING APPARATUS

James A. Makley, Miamisburg, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Feb. 17, 1982, Ser. No. 349,496
Int. Cl.[4] B41J *15/04*
U.S. Cl. 101—45 **14 Claims**

1. Printing apparatus, comprising: a frame, means for mounting a roll of a web of record members to the frame, means mounted to the frame for printing on the record members, means for feeding the web to the printing means, wherein the roll mounting means includes a support arm, means on the support arm for rotatably supporting the roll, means for holding the support arm in a selected position, the holding means



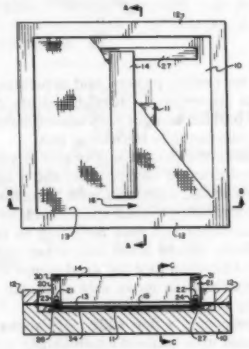
including a detent having means defining a plurality of recesses and a yieldable detent member selectively cooperable with the recess corresponding to the selected position, wherein the recesses are formed in the frame, a shaft coupled to the support arm and rotatably mounted in the frame, and the yieldable detent member being connected to the shaft.

4,549,484

THICK FILM SCREEN PRINTING APPARATUS

Wayne E. Neese, Hoffman Estates, Ill., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.

Filed Nov. 2, 1984, Ser. No. 667,676
Int. Cl.[4] B41L *13/02, 27/02*
U.S. Cl. 101—123 **5 Claims**



1. An improved thick film screen printing apparatus including a carriage having a planar top surface, a ceramic substrate attached to said carriage top surface and a frame member extending about the periphery of the carriage, said frame member including a mesh screen attached to said frame member and suspended over said substrate, said improvement comprising:

a pair of force absorbing means each attached to said carriage top surface in spaced relationship to and on opposite sides of said substrate; and,

a squeegee holder including a pair of rolling means each attached to an opposite end of said squeegee holder, each rolling means in registration with a respective one of said absorbing means, said mesh screen extending between said pair of rolling means and said pair of force absorbing means, and a squeegee extending outward of a bottom surface of said squeegee holder intermediate said pair of rolling means, whereby said squeegee holder is drawn

across said screen deflecting said screen onto said substrate and said force absorbing means and each of said rolling means travels along a respective force absorbing means.

4,549,485

PAPER WEB SEIZING APPARATUS FOR USE WITH PRINTING MACHINERY

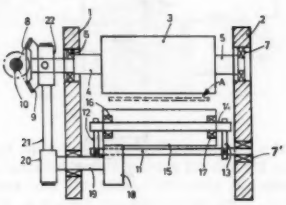
Nikolaus Nawrath, Igenhausen, Fed. Rep. of Germany, assignor to M.A.N. Roland-Druckmaschinen Aktiengesellschaft, Augsburg, Fed. Rep. of Germany

Filed Mar. 23, 1983, Ser. No. 478,071

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1982, 3215473

Int. Cl.⁴ B41F *13/02*

U.S. Cl. 101—219 **13 Claims**



1. Web seizing apparatus for combination with a printing machine having a printing cylinder, to seize a web (A) which may tear as it passes through the printing machine having

a support frame (1, 2);

a pair seizing rollers (3, 15);

bearings (6, 7; 16, 17) supporting said rollers in the support frame, spaced from each other, and located for passage of the web (A) between the rollers without contact therewith;

drive means (8, 9, 10; 18–22) positioned in driving engagement with said rollers to rotate the rollers; and

means (7', 11, 12, 13) for supporting the bearings of at least one (15) of the rollers in the frame for relative movement with respect to the other roller (3) for clamping the web (A) between the rollers in case of tearing of the web to thereby prevent winding of the web about a printing cylinder of the printing machine

wherein, in accordance with the invention,

the bearing support means (7', 11, 12, 13) for said at least one (15) movable roller are positioned to move said at least one roller out of engagement with the drive means (18–22) for said at least one roller and for subsequent driving engagement with the other roller, with the web interposed, and thereby permit free rotation by spinning inertia of said at least one roller during said movement from engaged position with the drive means to engagement with the other roller.

4,549,486

SMOKE CANISTER

Robert E. Betts; John F. Crawford, and Robert E. McNeill, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 25, 1984, Ser. No. 614,075

Int. Cl.⁴ F42B *13/44*

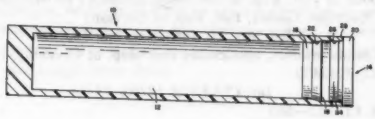
U.S. Cl. 102—334 **2 Claims**

1. A smoke canister comprising:

a. a methyl methacrylate tubular member having an open end and a closed end, said tubular member having a smoke producing chemical therein and a pair of bevelled surfaces on the inner surface thereof adjacent said open end;

b. first and second plug members having bevelled surfaces thereon for mating engagement with said bevelled surfaces of said tubular member, said first plug member disposed in said tubular member below said second plug member, said second plug member provided with a shoulder adjacent said tapered surface for engagement with the outer edge of said tubular member;

c. cement means disposed around said plug members for



securing said plug members in said tubular member in serial relation, said cement means comprised of methyl methacrylate containing non-functional plasticisers dissolved in methyl chlorine; and,

d. seal means of castable material disposed atop said first plug member, said seal means is castable methyl methacrylate placed atop said first plug member and allowed to cure.

4,549,487

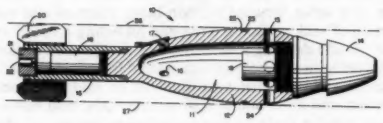
PRACTICE PROJECTILE WITH VARIABLE RANGE

Jens C. Jensen, Kokkedal, Denmark, assignor to Pocal Industries, Inc., Moscow, Pa.

Filed Sep. 29, 1983, Ser. No. 537,121

Int. Cl.⁴ F42B *13/20*

U.S. Cl. 102—498 **14 Claims**



1. In a practice mortar shell having a shell portion, a fuse portion and a finned tail portion for firing from the barrel of a firearm, the combination comprising:

(a) the shell body portion having a front end section and a rear end section and including an outer surface, an inner gas-conveying passage, propellant gas ingress aperture means and propellant gas exit aperture means,

(b) the outer surface including an outer, caliber section which contacts the inside surface of the barrel out of which barrel the shell is fired,

(c) the outer caliber section is located intermediate the front and rear end sections,

(d) the inner gas-conveying passage extends inside the shell body portion between the front end and rear end sections,

(e) propellant gas ingress aperture means are located in the rear end section behind the outer, caliber section and openly connect the rear end section of the inner gas-conveying passage to the outside of the shell body portion immediately upon firing of the firearm, and

(f) the propellant gas exit aperture means are located in the front end section ahead of the outer, caliber section and openly connect the front end section of the inner gas-conveying passage to the outside of the shell body portion,

(g) upon firing of the firearm, said shell body being effective to direct propellant gases immediately upon firing to move from outside the shell body portion into and through the propellant gas ingress aperture means, forwardly within the shell body portion along the inner gas-conveying passage and out the propellant gas exit aperture means for controlling the overall projectile range of the mortar shell, means,

(h) the exit aperture means having an opening with a suffi-

cient amount of area compared to the area of the ingress opening means to avoid damage in pressure build-up inside the shell body.

4,549,488

PROJECTILE HAVING A TUBULAR BODY

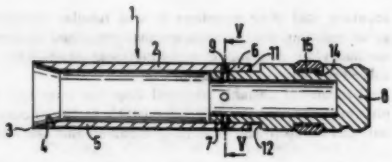
Dietrich Hoffmann, Schramberg, and Udo Gotz, Trossingen, both of Fed. Rep. of Germany, assignors to Mauser-Werke Oberndorf GmbH, Fed. Rep. of Germany

Filed Nov. 18, 1983, Ser. No. 553,190

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1982, 3243430

Int. Cl.⁴ F42B *13/00, 13/16*

U.S. Cl. 102—503 **2 Claims**



1. A projectile comprising a tubular projectile body having a rear portion with a bottom face, a sabot having a forward portion connected to said rear portion and having an exterior surface with an annular groove, a rotating band inserted in said annular groove, said rear portion of said projectile body being of a size and shape conformable to the forward portion of said sabot and being engaged one within the other, and a plurality of uniformly circumferentially distributed radial pins connecting said tubular body rear portion to said sabot forward portion, said sabot forward portion being inserted into said rear portion of said projectile body and including a raised exterior wall portion defining a shoulder, said rear portion of said body terminating in said bottom face spaced from said shoulder by a distance at least equal to a diameter of said pins connected between said sabot and said projectile body, said bottom face of said tubular body having corrugations facing said shoulder for forming an engagement with said shoulder of said sabot after said pins are sheared to impart spin of said sabot at least partly to said tubular projectile body, said rear portion having an outer diameter corresponding to an outer diameter of said shoulder, said projectile body being made of material which is harder than that of said sabot and said corrugations being selected to have at least one of a depth and an edge sharpness for permitting at least some slippage between a spin of said sabot and an imparted spin of said tubular body.

4,549,489

CARTRIDGE FOR LAUNCHING ELECTROMAGNETIC DECOYS WITH MULTIPLE CHARGES

Alain Billard, Muret; Hubert Calmettes, Villeneuve Tolosane, and André Santalucia, Muret, all of France, assignors to Societe E. Lacroix - Tous Artifices, Muret, France

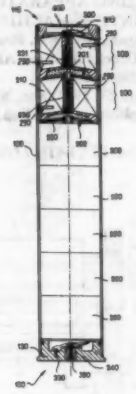
Filed Feb. 9, 1983, Ser. No. 465,284

Claims priority, application France, Feb. 17, 1982, 82 02575

Int. Cl.⁴ F42B *13/00*

U.S. Cl. 102—505 **10 Claims**

1. A cartridge for launching electromagnetic decoys comprising an elongated tube having an open upper end and a closed lower end, a plurality of flat holders containing electromagnetic decoys stacked over the length of the tube and having upper and lower surfaces, at least one of the upper and lower surfaces of each flat holder being a conical surface, each flat holder being populated between the upper and lower surfaces with a plurality of decoy flakes, at least certain of the flat holders having at least one transverse cut passing through the load of decoys to provide flakes of lengths which vary in accordance with the frequency bands of the electromagnetic waves to be covered by the decoys when launched and scattered in a cloud, a pyrotechnic charge in the lower part of each flat holder to project the holder in the direction of the open end of the tube and to proceed with dispersion of the decoys, each charge being connected to the adjacent charge by a pyrotechnic retarder, the uppermost charge of the stack being



provided with at least one pyrotechnic initiator, such that the arrangement formed by the initiator, the charges, and the retarders forms a continuous pyrotechnic chain, in order to allow, after detonating the initiator, the successive ejection of the flat holders in a predetermined time sequence.

4,549,490

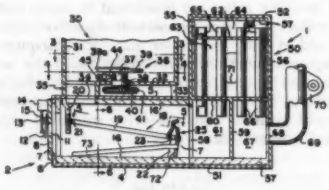
FURNACE CONSTRUCTION

Clifford C. Wetzel, Rte. 2; Gerald L. Wetzel, 1080 S. Croswell Rd., and James C. Wetzel, Rte. 2, all of, Ithaca, Mich. 48847

Filed Jul. 24, 1984, Ser. No. 633,846

Int. Cl.⁴ F23K *3/00*

U.S. Cl. 110—101 R **14 Claims**



1. A furnace construction comprising a housing having a storage compartment for the accommodation of particulate fuel and a combustion chamber beneath said storage compartment, said housing having an upstanding side wall and a bottom, said bottom having an opening therein through which fuel may pass into said combustion chamber; an elongate fuel feed member; means mounting said feed member within said storage compartment for movement in a rotary path about an axis, said feed member being offset transversely from said axis and extending from adjacent said axis toward said side wall and adjacent said bottom, said feed member being of such length as to span said opening; and driving means for driving said feed member along said path.

4,549,491
FEED DRIVE FOR A STITCH GROUP SEWING MACHINE

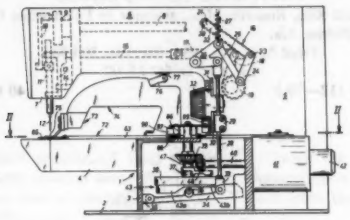
Ernst Albrecht, Hochspayer, and Edgar Busch, Trippstadt, both of Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed May 30, 1984, Ser. No. 615,461

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1983, 3320158

Int. Cl.⁴ D05B *3/06*

U.S. Cl. 112—73 **4 Claims**



1. A stitch group sewing machine comprising a housing, a sewing needle mounted in said housing for upward and downward movement and for lateral swinging movement in a swinging plane, a sewing machine main drive including a rotatable arm shaft connected to said needle for moving said needle in upward and downward and swinging motion, a work holder mounted on said housing for swinging movement across the swinging plane of said needle, a cam plate rotatable in said housing connected to said work holder for controlling the swinging movement of said work holder, a separate cam plate drive motor in said housing connected to said cam plate for rotating said cam plate, a gearing having an adjustable transmission and connected between said work holder and said cam plate, and a control device connected to said sewing machine cam plate drive motor and said sewing machine main drive and said gearing for varying a resultant stitch length which is formed by said sewing machine.

4,549,492
MATERIAL CLAMP FOR SEWING MACHINES

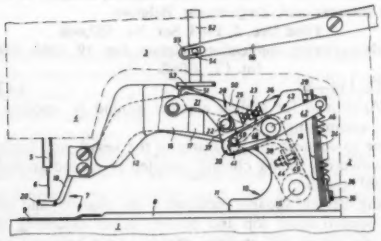
Ernst Albrecht, Hochspeyer, and Edgar Busch, Trippstadt, both of Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed May 23, 1984, Ser. No. 613,289

Claims priority, application Fed. Rep. of Germany, May 28, 1983, 3319420

Int. Cl.⁴ D05B *39/00*

U.S. Cl. 112—76 **7 Claims**



1. A material clamp for sewing machines having a support over which the material is fed, comprising a pivot arm having one end with a material engaging part, a toggle lever drive for said arm pivotally supported at one end and having an opposite end pivotally connected to said arm, setting means associated with said drive and acting thereon to adjust said arm during movement between a position in which it engages and clamps the material with said material engaging part to a position in which said arm with said material engaging part is moved away from the material to unclamp the material, a spring mechanism connected to said lever drive including a spring acting on said lever drive to bias in a one direction in respect to the clamping and unclamping of the material, said setting means acting on said toggle lever drive in a direction counter to the biasing of said spring mechanism, and an actuating mechanism coupled to said setting means and effecting a movement of said toggle lever drive.

4,549,493
METHOD AND APPARATUS FOR APPLYING A GUSSET TO MANUFACTURED GOODS

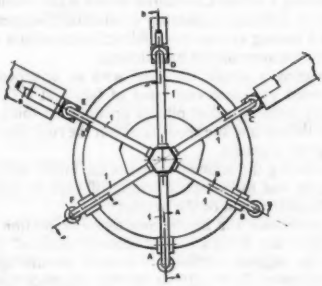
Vinicio Gazzarrini, Florence, Italy, assignor to Solis, S.r.l., Florence, Italy

Filed Dec. 26, 1979, Ser. No. 107,426

Claims priority, application Italy, Jan. 9, 1979, 9311 A/79

Int. Cl.⁴ D05B *21/00*

U.S. Cl. 112—121.15 **28 Claims**



1. A machine for applying a gusset to a pantyhose comprising:

a carrousel type structure with a plurality of outwardly extending arms, said carrousel type structure dewlling at a plurality of stations, one station for each said outwardly extending arm;

a hollow support member carried on said arms;

operating stations disposed in the path of movement of said arms;

supporting means for supporting the pantyhose in stretched apart disposition over said support member to form a stretched out zone;

pneumatic inverting and drawing means for inverting the body of the pantyhose and drawing the legs thereof internally of said hollow support member with the legs disposed, stopped and held within said hollow support member;

horizontally moving securing means for retaining the legs of said pantyhose in a fixed position;

means for positioning and pressing a gusset to the stretched out zone of the pantyhose when held in the fixed position;

means for trimming the excess fabric from the gusset about the stretched out zone;

a sewing device disposed at one of said stations for sewing the gusset to the stretched out zone of the pantyhose;

pneumatic removal means for removing the pantyhose from the support and withdrawing the legs from said hollow support member; and

means for releasing said securing means and means for reversing the pantyhose to its right side out position.

4,549,494

REVERSIBLE SHADOW MULTICOLORED TRAPUNTO

Marjorie M. Murphy, 6624 April Bayou, Biloxi, Miss. 39532

Filed Jun. 23, 1983, Ser. No. 506,905
Int. Cl.[4] D05C *1/08*
U.S. Cl. 112—266.1 9 Claims

1. A method of forming reversible shadow multi-color trapunto designs comprising the steps of:

a. laminating a plurality of thin fabric layers, at least one of the fabric layers being sheer;

b. forming a stitched, bordered design in the laminated fabric layers defining a plurality of enclosed segmented areas, each having two or more fabric layers with a void therebetween surrounded by stitching;

c. inserting a needle threaded with an attached length of colored yarn into one layer of fabric at a first point of entry defining a first minute opening the thickness of the needle and into the space between the two fabric layers of a given segment;

d. traversing the segment between the fabric layers with the needle and the attached length of yarn so that the yarn follows the path of the needle;

e. withdrawing the needle and one end portion of the attached yarn from a second selected point of withdrawal on the segment defining a second minute opening the thickness of the needle, so that the attached yarn occupies space in the void between the fabric layers between the point of entry and the point of withdrawal formed by the needle; and

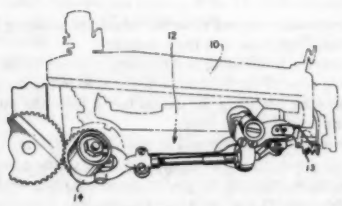
f. cutting the ends of the yarn at the fabric surface adjacent the points of entry and withdrawal so as to leave an elongated middle portion of the yarn entirely within the stitched border of the design segment.

4,549,495

STITCH SHORTENING DEVICE FOR A BLIND STITCH SEWING MACHINE

Robert Bouthillier, Dayville, Conn., assignor to Louis Hand, Inc., Fall River, Mass.

Filed Sep. 4, 1984, Ser. No. 647,151
Int. Cl.[4] D05B *1/24, 27/22*
U.S. Cl. 112—315 9 Claims



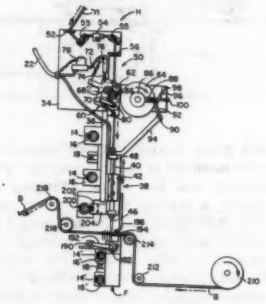
1. A variable stitching device for a sewing machine having a feed drive lever for operating the feed dog, a drive shaft from the sewing machine, and means on the drive shaft for reciprocating the lever, comprising a multiple cam mounted on the drive shaft, adjustment means for adjusting the relative positions of said cams, the feed drive lever having an integral loop, said multiple cams extending through the loop to reciprocate the lever, and drive means for operating said adjustment means during actuation of the sewing machine.

4,549,496

APPARATUS AND METHOD FOR PRODUCING PATTERNED TUFTED GOODS

H. Buford Kile, Rossville, Ga., assignor to Fabrication Center, Inc., Dalton, Ga.

Filed Mar. 16, 1984, Ser. No. 590,504
Int. Cl.[4] D05C *15/02*
U.S. Cl. 112—79.5 40 Claims



1. Apparatus for producing patterned tufted goods, comprising means for advancing a backing past a yarn-applying region; yarn-applying means disposed at the yarn-applying region for penetrating the backing and for implanting yarn therein, the yarn-applying means being movable transversely to the direction of advancement of the backing for successively implanting yarn along a transverse row; means for supplying a plurality of different yarns to the yarn-applying means; and means for controlling the supplying means in accordance with a predetermined pattern to select which of said yarns or combinations of said yarns, if any, is implanted in the backing at each said penetration.

4,549,497

DEVICE FOR UNDERWATER SEALING PORTS OR SIMILAR, NOTABLY THE BOTTOM TRAPS FROM HOPPER BARGES

Emile Van Hove, 'S-Gravenwezel, Belgium, assignor to Dredging International, Zwijndrecht, Belgium

Filed Dec. 2, 1983, Ser. No. 557,608
Claims priority, application Belgium, Jan. 19, 1983, 209931
Int. Cl.[4] E06B *7/16*
U.S. Cl. 114—36 4 Claims

1. Apparatus for sealing a panel around an opening in a vessel, comprising:

a frame to connect the apparatus to the vessel, and forming a downwardly facing channel adapted to extend around the vessel opening;

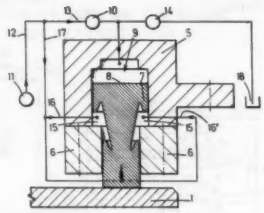
a sealing element slidably mounted in the channel, and including spaced apart top and bottom heads extending transversely across the channel, the top head having a larger transverse length than the bottom head;

the frame and the top head of the sealing element forming an upper chamber, above the top head;

the frame and the top and bottom heads of the sealing element forming a lower chamber, between the top and bottom heads;

first fluid lines means connected to the top chamber to conduct pressurized fluid thereinto to move the sealing element downward and into sealing engagement with the panel, and to discharge pressurized fluid from the top chamber;

second fluid line means connected to the lower chamber to



conduct pressurized fluid thereinto to move the sealing element upward away from sealing engagement with the panel, and to discharge pressurized fluid from the lower chamber; and

valve means located in the first fluid line means to control the flow of pressurized fluid therethrough.

4,549,498

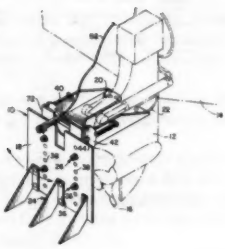
SPEED CONTROLLING APPARATUS

Dennis F. Meyer, and James E. Schuster, both of Bismarck, N. Dak., assignors to I.M.S., Inc., Bismarck, N. Dak.

Continuation-in-part of Ser. No. 374,173, May 3, 1982, abandoned. This application Aug. 23, 1982, Ser. No. 410,831

Int. Cl.⁴ B63H *25/44*

U.S. Cl. 114—145 A **23 Claims**



1. Speed controlling apparatus adapted to be mounted with respect to a boat's motor, which drives a propeller for forming a wash directed along a path rearwardly of the boat's stern, said apparatus comprising:

a. a deflection plate;

b. means for mounting said deflection plate with respect to the boat's motor for movement between a first position confronting the propeller wash and a second position remote from the path of the propeller wash; and

c. at least one vane fixedly attached to said deflection plate and extending in a direction along and into the path of the propeller wash for providing increased stability and control of the boat's movement through water and said vane comprises an extended portion that extends below the lower most edge of the said deflection plate and into the propeller wash.

4,549,499

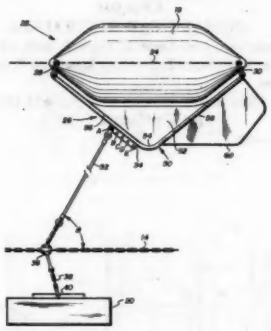
FLOATATION APPARATUS FOR MARINE SEISMIC EXPLORATION

Donald F. Huffhines, Richardson, and Robert E. Roach, Duncanville, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 265,131, May 19, 1981, abandoned. This application Mar. 12, 1984, Ser. No. 588,429

Int. Cl.⁴ B63B *21/66*

U.S. Cl. 114—244 **2 Claims**



1. In combination:

a marine vessel having a tow line;

floatation means for maintaining the surface position of a marine apparatus;

frame means attached to said floatation means for connecting said floatation means to said tow line;

bracket means fixed to said frame means at an angle inclined to the horizontal having a plurality of adjustment means for altering the tow depth of said marine apparatus;

rudder means moveably mounted on said frame means for controlling planar parallel placement of said floatation means with respect to said towing vessel; and

stabilizer means mounted on said frame means for maintaining the center line of said floatation means perpendicular to said marine vessel.

4,549,500

PROGRAMMING AID DEVICE

Anne-Marie Lowin, and Eleanor G. Wight, both of Kingston, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 12, 1983, Ser. No. 484,133

Int. Cl.⁴ B42D *9/00*

U.S. Cl. 116—240 **13 Claims**

FIG. IA	FIG. IB
FIG. IC	FIG. ID

1. A device for aiding in the interpretation of collimated fields of data in a printed computer output comprising;

a data record inscribed on said device and being in a predetermined form correspoding to said collimated fields so that the data record aligns with and identifies data fields in a single row of said collimated fields of data when said

device is positioned in association with said single row of said computer output;

said data record including predetermined eyecatcher data to match against eyecatcher data in a selected single row of computer output to aid in aligning said data record with said selected single row of computer output, and

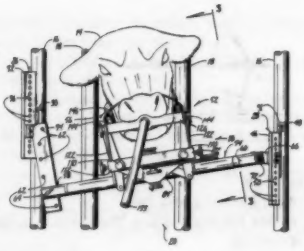
an information section used for interpreting data in said selected single row of said collimated fields of data as identified by predetermined fields of said data record.

4,549,501

ANIMAL HEAD RESTRAINER

Lloyd L. Anderson, and Leon E. Girard, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed May 17, 1984, Ser. No. 611,174
Int. Cl.⁴ A01K *1/06*
U.S. Cl. 119—99 **20 Claims**



1. An animal head restrainer for holding the head of an animal confined in an elongated animal chute having forward and rearward ends and an opening in said forward end through which the head of the animal extends, said head restrainer comprising:

a pair of bracket assemblies attached to said chute, one of said assemblies being attached on either side of said opening in said chute,

a head cradle for holding the head of the animal and having forward and rearward ends and opposite sides and being connected at said rearward end to said bracket assembly in spaced relation to said chute,

first adjustment means on said bracket assemblies for pivoting said cradle about a horizontal axis whereby the head of the animal is tiltable from side to side, said horizontal axis being substantially parallel with the longitudinal axis of said chute,

second adjustment means on said cradle for pivoting a portion of said cradle about a vertical axis whereby the head of the animal is laterally movable from side to side, and

third adjustment means on said cradle for tilting the head of the animal upwardly or downwardly from a horizontal plane.

4,549,502

APPARATUS FOR WASHING ANIMALS

Bahram Namdari, P.O. Box 17366, Milwaukee, Wis. 53217

Filed Apr. 19, 1982, Ser. No. 369,919
Int. Cl.⁴ A01K *13/00*
U.S. Cl. 119—158 **8 Claims**

1. Apparatus for washing an animal comprising:

an enclosure for said animal,

said enclosure having a closeable opening for enabling placement of said animal within said enclosure,

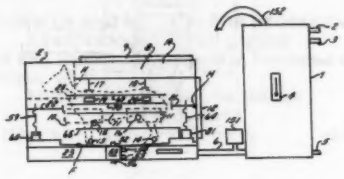
said enclosure having an opening for protrusion of the head of said animal;

means within said enclosure for restraining said animal;

means within said enclosure for directing a cleansing liquid against said animal;

frame means within said enclosure movable relative to said enclosure between an inoperative position and an operative washing position;

means within said enclosure for effecting movement of said frame means;



a plurality of brushes within said enclosure mounted on said frame means for contact with said animal;

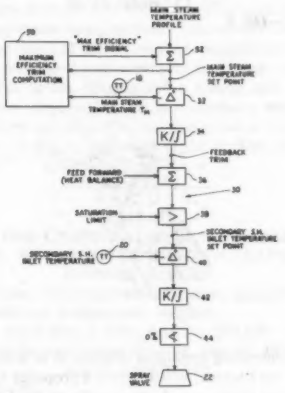
and means for moving said brushes relative to said frame means against said animal when said frame means is in its washing position to effect cleansing.

4,549,503

MAXIMUM EFFICIENCY STEAM TEMPERATURE CONTROL SYSTEM

Marion A. Keyes, IV, Chagrin Falls; Michael P. Lukas, Eastlake, and William H. Moss, Concord Township, Lake County, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed May 14, 1984, Ser. No. 609,624
Int. Cl.⁴ F22G *5/00*
U.S. Cl. 122—479 R **5 Claims**



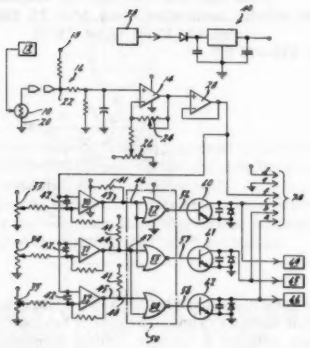
1. A system for maximizing the main steam temperature in a power generation boiler/turbine installation comprising means producing an output signal representative of the temperature of the steam entering the turbine, means for comparing said output signal representative of said turbine steam temperature with a maximum safe operating temperature of said boiler/turbine installation, said comparing means producing an output signal representative of the difference between said turbine steam temperature and said maximum safe operating temperature, and means responsive to said difference output signal producing a trim signal to vary a set point for determining said turbine steam temperature.

4,549,504

ELECTRONIC CONTROLLER FOR REGULATING TEMPERATURE WITHIN AN INTERNAL COMBUSTION ENGINE SYSTEM

Donald R. Gaines, Farmington Hills, and Donald L. Gaines, Northville, both of Mich., assignors to Evans Products Company, Coldwater, Mich.

Filed Jul. 19, 1984, Ser. No. 632,607
Int. Cl.[4] F01P 11/16
U.S. Cl. 123—41.01 12 Claims



1. An electronic controller for regulating temperature within an internal combustion engine system having a plurality of electrically controllable temperature dissipating mechanisms, comprising:

temperature sensing means for thermal coupling with said engine system and for providing temperature indicating signal;

means for providing a plurality of reference signals;

first comparator means for determining a first relationship between said temperature indicating signal and one of said reference signals and for providing a first signal indicative of said first relationship;

second comparator means for determining a second relationship between said temperature indicating signal and another of said reference signals and for providing a second signal indicative of said second relationship;

logic gating means responsive to said first and second signals for providing first and second digital output signals for controlling said temperature dissipating mechanisms, said logic gating means comprising;

a first semiconductor gate responsive to said first signal; and

a second semiconductor gate responsive to said first and second signals;

said first gate providing said first digital output signal when receptive of said first signal;

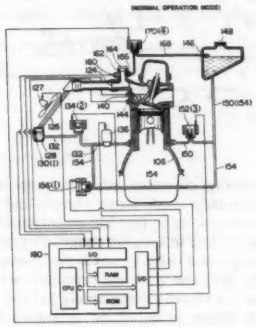
said second gate providing said second digital output signal when receptive of said first signal and said second signal simultaneously, said output signals thereby occurring in controlled temporal relationship to one another determined in accordance with said first and second signals.

4,549,505

COOLING SYSTEM FOR AUTOMOTIVE ENGINE OR THE LIKE

Yoshinori Hirano, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 23, 1984, Ser. No. 663,911
Claims priority, application Japan, Oct. 25, 1983, 58-199864; Oct. 26, 1983, 58-198970
Int. Cl.[4] F01P 3/22
U.S. Cl. 123—41.08 7 Claims



1. In an internal combustion engine having a combustion chamber;

a radiator;

a coolant jacket in which coolant is boiled and the vapour produced fed to said radiator for condensation therein;

a reservoir containing coolant;

a first conduit leading from said radiator to said coolant jacket, said first conduit including a pump for returning liquid coolant from said radiator said said coolant jacket and a first valve, said first valve having an open position wherein fluid can flow therethrough and a closed position wherein fluid is prevented from passing therethrough to said coolant jacket;

a second conduit which communicates with said reservoir at one one end thereof and which communicates with said coolant jacket at the other end thereof, said second conduit including a second valve having an open position and a closed position;

a third conduit which communicates at one end thereof with said reservoir and which communicates at the other end thereof with one of said radiator and said first conduit at a location between said pump and said radiator, said third conduit including a third valve, said third valve having an open position and a closed position; and

a control circuit for controlling the operation of said pump, first, second and third valves.

4,549,506

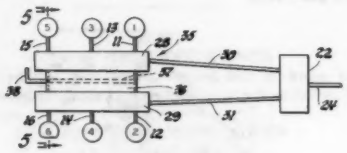
ENGINE INTAKE SYSTEM WITH MODULATED TUNING

William B. Rush, II, Clarkston, and Rodney B. Rask, Grosse Pointe Woods, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 16, 1984, Ser. No. 600,414
Int. Cl.[4] F02B 27/00
U.S. Cl. 123—52 MB 2 Claims

1. A modulated tuning intake system for a V-type internal combustion engine having a pair of adjacent longitudinal cylinder banks containing a plurality of cylinders each included in one of two cylinder groups, a longitudinally elongated manifold plenum for each group and runners connecting each plenum with the cylinders of its respective group, said manifold plenums extending longitudinally in laterally spaced side by

side relationship with one another and the adjacent cylinder banks, a common chamber for the system, a pair of conduits, one connecting each manifold plenum with the common chamber, said system being tuned to provide an enhanced level of cylinder charging volume in a predetermined lower range of engine speeds, and the improvement comprising a connector laterally joining the dual manifold plenums continuously along at least half their longitudinal extent and providing a large area



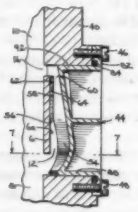
passage internally communicating the separate plenums to effectively provide a single larger plenum and thereby modify the system tuning so as to provide an enhanced level of cylinder charging volume in a higher range of engine speeds above said lower range, and valve means in said passage and movable to selectively open and close the communication of said separate plenums and thereby respectively provide the lower and higher speed ranges of enhanced cylinder charging for the intake system.

4,549,507

TWO CYCLE LOOP SCAVENGED ENGINE WITH IMPROVED TRANSFER PASSAGE FLOW

Robert J. Baumhardt, Eden, Wis., assignor to Brunswick Corp., Skokie, Ill.

Filed Sep. 19, 1984, Ser. No. 652,299
Int. Cl.[4] F02B *33/04*
U.S. Cl. 123—59 B **7 Claims**



1. In a two cycle loop scavenged internal combustion engine having a piston reciprocal in a cylinder between a crankcase and a combustion chamber in a die cast cylinder block having a transfer passage between said crankcase and an intake port in said combustion chamber, said transfer passage extending within said cylinder block along the exterior wall of said cylinder and having a die-receiving opening generally opposite to said exterior cylinder wall to permit die casting of said cylinder block, and having a die cast port runner cover received in said opening, said port runner cover having a given configuration to shape said transfer passage and direct flow from said crankcase in a path outwardly away from said cylinder wall and curving and funneling said passage to a smaller lateral area toward said intake port to increase flow velocity thereat,

the improvement comprising: means in said transfer passage blocking flow contiguously along said exterior cylinder wall in said transfer passage which would otherwise short-circuit the flow through the remainder of said transfer passage in said path curved away from said cylinder wall and funneled to said smaller area at said intake port, whereby to afford intake port flow in said combustion chamber in a direction determined by the non-short-circuited path in said transfer passage, and substantially eliminate direction-altering flow in said combustion chamber from said intake port otherwise due to said short-circuit path, wherein said blocking means in said transfer passage

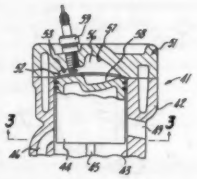
comprises fuel-resistant material trapped between and engaging portions of said exterior cylinder wall and said port runner cover toward the intake port end of said transfer passage.

4,549,508

TWO-CYCLE INTERNAL COMBUSTION ENGINE

Hiroaki Fujimoto, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata and Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, both of, Japan

Filed Mar. 14, 1983, Ser. No. 475,183
Claims priority, application Japan, Mar. 31, 1982, 57-52685
Int. Cl.[4] F02B *33/04, 23/08*
U.S. Cl. 123—73 PP **3 Claims**



1. In a combustion chamber for a two-cycle internal combustion engine having a cylinder, a cylinder head and a reciprocating piston defining a variable volume combustion chamber comprised at minimum volume conditions of a first portion of relatively small volume formed in said cylinder head formed from a pair of generally flat side walls and a substantially rectangular planar top wall forming an open channel groove shape having an inlet end and an opposed outlet end surrounded on all sides but its outlet end by a squish area and a second portion of larger volume communicating at one side thereof with the outlet end of said first portion, a spark plug carried by said cylinder head with its gap in said first portion, scavenge port means in said cylinder for admitting a charge to said combustion chamber and configured to direct said charge toward the inlet end of said first portion, said second portion having its largest cross-sectional area adjacent said outlet end of said first portion, said largest cross-sectional area having an area greater than said outlet end and the cross-sectional area of said second portion continuously decreasing toward a side opposite the one side that communicates with said first portion.

4,549,509

TAPPET

Darrell A. Burtchell, 141 Route 81, Killingworth, Conn. 06417

Filed Sep. 20, 1984, Ser. No. 652,276
Int. Cl.[4] F01L *1/14*
U.S. Cl. 123—90.16 **5 Claims**

1. In a tappet, which comprises; a rod having

(i) a first end;

(ii) a second end, including a cam following surface which is a roller surface;

(iii) a rod body between and joining the first and second ends; and

(iv) a central axis running through the center of the rod body from the first end to the second end, dividing the rod body into a forward half and a rearward half;

said tappet being slidably fit within a tappet guide;

the improvement, which comprises; said cam following surface being positioned off said axis in one of the forward and rearward halves.

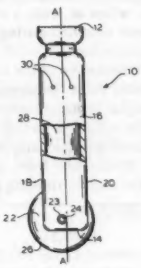
5. A method of adjusting the timing of a valve train, said

valve train comprising a camshaft, a cam follower, a tappet slidingly fitted in a tappet guide, a rocker arm and a valve, said tappet comprising a rod body having

(i) a first end;

(ii) a second end, including a roller cam following surface;

(iii) a rod body between and joining the first and second ends; and



(iv) a central axis running through the center of the rod body from the first end to the second end, dividing the rod body into a forward half and a rearward half;

which comprises; replacing the tappet of said valve train with a tappet having the roller cam following surface positioned off said axis in one of the forward and rearward halves.

4,549,510

ARRANGEMENT OF MULTIPLE VALVES FOR AN INTERNAL COMBUSTION ENGINE

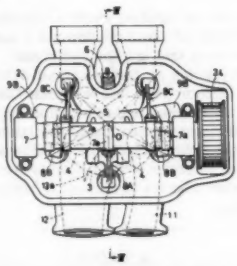
Shinichi Miyakoshi, Fujimi, and Naoto Hara, Tsurugashima, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 26, 1984, Ser. No. 674,812

Claims priority, application Japan, Nov. 25, 1983, 58-220693; Dec. 9, 1983, 58-189178[U]; Dec. 14, 1983, 58-234381

Int. Cl.⁴ F01L *1/02;* **F02B** *15/00*

U.S. Cl. 123—90.27 **4 Claims**



1. A multiple-valve internal combustion engine having three intake valves and two exhaust valves provided for a common cylinder, characterized in that the three intake valves and the two exhaust valves are disposed in a cylinder head thereof with the intake valves positioned on one side on a circumference surrounding a center line of a combustion chamber thereof and the exhaust valves positioned on the other side thereon in a radial disposition wherein longitudinal axes all valves cross one another at a point on a longitudinal axis of the cylinder, and an ignition plug is provided in a space between the two exhaust valves and is inserted through the cylinder head in an inclined posture with a forward end thereof directed toward the center of the combustion chamber, and a single common cam shaft is provided horizontally at an intermediate position of the cylinder head between a disposition section of the intake valves and a disposition section of the exhaust valves so that the respective valves may be driven by the common shaft.

4,549,511

FUEL INJECTION SYSTEM FOR DIRECT FUEL INJECTION IN INTERNAL COMBUSTION ENGINES

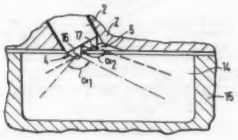
Hermann Grieshaber, Stuttgart, and Hans-Joachim Siebert, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 27, 1982, Ser. No. 423,579

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151293

Int. Cl.⁴ F02B *23/06*

U.S. Cl. 123—263 **10 Claims**



1. A fuel injection system for direct fuel injection into combustion chambers of an internal combustion engine having one injection valve injecting a pre-injection quantity into the respective combustion chamber and a further injection valve injecting the main injection quantity into the combustion chamber, wherein the exit points of the fuel of the respective two fuel injection valves are placed adjacent to one another, and having at least one fuel injection pump for the supply of fuel to the injection valves, comprising, plural injection ports (**16**, **17**) in equal numbers for the injection valve for the pre-injection quantity and for the injection valve for the main injection quantity, the area of each of the openings of the injection ports (**16**) for the pre-injection quantity being smaller than that of the injection ports (**17**) for the main injection quantity, the injection ports for the pre-injection quantity directing the respective streams thereof to a target area in said combustion chamber common to the respective streams directed from the injection ports for the main injection quantity, and the terminal points for the pre-injection streams being downstream in the direction of swirl in the combustion chamber with respect to the terminal points for the main injection streams.

4,549,512

INTAKE AIR AMOUNT CONTROL APPARATUS OF INTERNAL COMBUSTION ENGINE

Mitsunori Takao, Kariya; Takahiko Kimura, Nagoya, and Yuzi Hirabayashi, Aichi, all of Japan, assignors to Nippondenso Company Ltd., Kariya, Japan

Filed Sep. 13, 1984, Ser. No. 650,212

Claims priority, application Japan, Sep. 21, 1983, 58-174712

Int. Cl.⁴ F02D *33/02*

U.S. Cl. 123—339 **8 Claims**

1. An intake air amount control apparatus of an internal combustion engine, comprising:

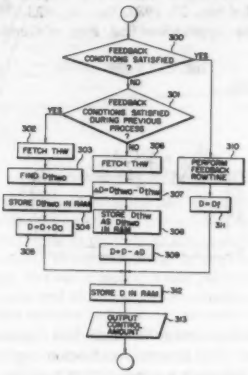
control mode detection means for detecting one of an open-loop control mode and a feedback loop control mode from operating conditions of the engine;

feedback control amount calculation means for calculating a feedback control amount in accordance with a detection output corresponding to said operating conditions when said control mode detection means detects said feedback loop control mode;

change detection means for detecting a change from said feedback loop control mode to said open-loop control mode;

first control amount calculation means for obtaining a first control amount corresponding to conditions of the engine during warming-up and storing the first control amount when a change detection signal from said change detection means is generated, and for calculating an open-loop control amount with reference to said feedback control amount;

second control amount calculation means for obtaining second control amount corresponding to said conditions



of the engine during warming-up storing the second control amount for as long as said open-loop control mode is continued, and for calculating another open-loop control amount corresponding to a difference between said first control amount and said second control amount; and

engine control means for controlling an intake air amount in accordance with said open-loop control amounts obtained by said first and second control amount calculation means, thereby controlling an engine speed in said open-loop control mode.

4,549,513

METHOD FOR THE AUTOMATIC ADJUSTMENT OF THE IGNITION INITIATION CONTROL TIME IN AN INTERNAL COMBUSTION ENGINE

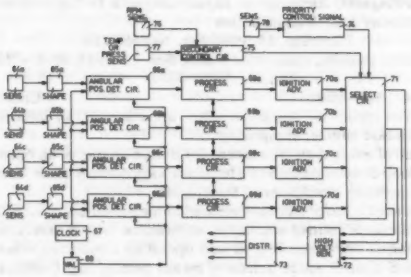
André Douaud, Puteaux, and Joseph Rialan, Meudon, both of France, assignors to Institut Francais Du Petrole, Rueil-Malmaison, France

Continuation-in-part of Ser. No. 309,168, Oct. 6, 1981,. This application Sep. 20, 1982, Ser. No. 420,553

Claims priority, application France, Jul. 26, 1978, 78 22542

Int. Cl.⁴ F02P *9/04*

U.S. Cl. 123—425 **16 Claims**



1. An improved method for the automatic control and regulation of the time of combustion initiation in an internal combustion engine having a drive shaft and comprising at least one cylinder provided with means for identifying the angular positions of the drive shaft corresponding to the occurrence of at least one event characteristic of the engine running conditions when said event and its detection has an aleatory character, the improvement comprising, for said at least one cylinder, measuring the angular position of the drive shaft at the moment at which said event occurs to obtain a number P of validated measurements, then, when at least a number P of validated measurements has been obtained during a number of cycles at most equal to a predetermined value Q, determining a statistical angular value representative of the validated measurements and, from said statistical value, generating and transmitting to the control means a signal representative of a modified value of the time of combustion initiation, so that said statistical value is equal to a predetermined value V, and wherein the value of P, Q and V is a value determined from at least one parameter having an effect on the engine running conditions.

4,549,514

METHOD AND APPARATUS FOR CONTROLLING KNOCKING OF AN INTERNAL COMBUSTION ENGINE

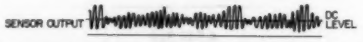
Osamu Abe; Yasunori Mouri, and Noboru Sugiura, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 24, 1983, Ser. No. 469,404

Claims priority, application Japan, Feb. 24, 1982, 57-27325

Int. Cl.⁴ F02P *5/04*

U.S. Cl. 123—425 **12 Claims**



1. A method for controlling knocking of an internal combustion engine comprising the steps of:

detecting an operation condition of said engine to determine a reference ignition point;

generating a number of electrical signal pulses corresponding to a knocking intensity in response to knocking during an ignition cycle;

counting said number of said pulses during said ignition cycle;

determining for an ignition cycle a retardation angle θ_{KN} relative to said reference ignition point based on the count obtained during said ignition cycle; and

gradually advancing an ignition point determined by said reference ignition point and said retardation angle;

said step of determining said retardation angle including the step of inhibiting retardation of the ignition point when said count for said ignition cycle is below a predetermined value, so as to create a dead zone in the control of said ignition point wherein said count is below said predetermined value.

4,549,515

FUEL INJECTION SYSTEM

Wolfgang Maisch, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 31, 1984, Ser. No. 687,899

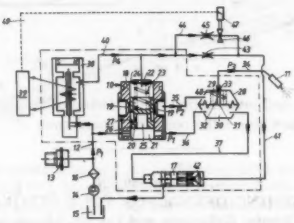
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1984, 3409763

Int. Cl.⁴ F02M *69/00*

U.S. Cl. 123—452 **13 Claims**

1. A fuel injection system for mixture-compressing internal combustion engines with externally supplied ignition, comprises at least one metering valve, disposed in a fuel supply line which is at system pressure, for metering fuel in accordance with engine operating characteristics, said at least one metering valve having a control piston displaceable in a metering sleeve that has a metering slit for each cylinder of said engine, the control piston being acted upon by a control pressure

established in accordance with the engine operating characteristics thereby and uncovering a corresponding cross section of the metering slits toward a fuel supply line to a greater or lesser extent, and having a differential pressure valve connected to each metering slit, the differential pressure valve communicating on the outlet side with an injection valve, wherein the metering sleeve has on one end face of the control piston a fuel supply chamber, connected to the fuel supply line, and on its



opposite end a control chamber communicating with a pressure adjuster generating a control pressure, the control chamber communicating via a first throttle with a fuel return line, said first throttle having a very small flow cross section, and a second throttle connected in parallel with said first throttle, said second throttle having a substantially larger flow cross section in series with a blocking valve operated by a control device.

4,549,516

METHOD OF CONTROLLING OPERATING AMOUNTS OF OPERATION CONTROL MEANS FOR AN INTERNAL COMBUSTION ENGINE

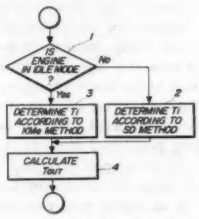
Takashi Koumura, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 19, 1984, Ser. No. 663,079

Claims priority, application Japan, Oct. 20, 1983, 58-196893

Int. Cl.⁴ F02M *5/02*

U.S. Cl. 123—478 **7 Claims**



1. A method of controlling an operating amount of an operation control means for controlling the operation of an internal combustion engine having an intake passage, and an intake air quantity control means arranged in said intake passage for adjusting the opening area of said intake passage, the operating amount of said operation control means being controlled in a first arithmetic manner to a first desired value determined on the basis of a first operating parameter of the engine when the engine is operating in a predetermined operating condition, while it is controlled in a second arithmetic manner to a second desired value determined on the basis of a second operating parameter of the engine when the engine is operating in a condition other than said predetermined operating condition, the method comprising the steps of:

(1) detecting the pressure of intake air upstream of said intake air quantity control means;

(2) when the engine is operating in said predetermined operating condition, determining a first correction value appropriate to said first arithmetic manner, as a function of the detected value of intake air pressure, correcting said first desired value of operating amount by the use of the determined first correction value, and controlling the operating amount of said operation control means to the corrected first desired value; and

(3) when the engine is operating in a condition other than said predetermined operating condition, determining a second correction value appropriate to said second arithmetic manner, as a function of the detected value of the intake air pressure, correcting said second desired value of operation amount by the use of the determined second correction value, and controlling the operating amount of said operation control means to the corrected second desired value.

4,549,517

FUEL SUPPLY DEVICE FOR INTERNAL COMBUSTION ENGINES

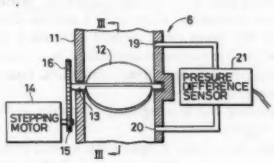
Shuichi Kamiyama, Tokyo, Japan, assignor to Mikuni Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 13, 1983, Ser. No. 561,094

Claims priority, application Japan, Dec. 13, 1982, 57-218121; Dec. 13, 1982, 57-218122

Int. Cl.⁴ F02B *3/00*

U.S. Cl. 123—478 **4 Claims**



1. A fuel supply device for internal combustion engines having an air supply quantity controlling system comprising:

a computer having therein a memory for storing (a) an air flow quantity characteristic related to the pressure difference between the upstream and downstream sides of a throttle valve, (b) an air flow quantity which passes through said throttle valve and (c) a throttle valve opening degree setting;

an actuator for adjusting the opening degree setting of said throttle valve, said actuator being controlled by said computer to control the air flow quantity to be supplied to said internal combustion engine;

a plurality of values of the throttle valve opening degree setting corresponding to the combinations of the (a) maximum air flow value stored in said memory which is smaller than a desired air flow quantity value at the current point in time, (b) the maximum pressure difference value stored in said memory which is smaller than said pressure difference value at the current point in time, (c) the minimum air flow quantity value stored in said memory which is larger than the desired air flow quantity value at said current point in time, and (d) the minimum pressure difference value stored in said memory which is larger than said pressure difference value at said current point in time being read out of said memory means by accessing said air flow quantity characteristic to said memory;

a desired throttle valve opening degree setting being computed in said computer by an interpolation process; and

said throttle valve being adjusted by said actuator to move to said desired throttle valve opening degree setting.

4,549,518

METHOD OF CONTROLLING OPERATING AMOUNTS OF OPERATION CONTROL MEANS FOR AN INTERNAL COMBUSTION ENGINE

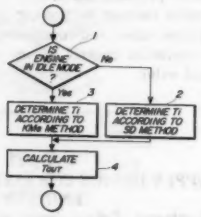
Takashi Koumura, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 19, 1984, Ser. No. 663,000

Claims priority, application Japan, Oct. 20, 1983, 58-196892

Int. Cl.⁴ F02M *5/02*

U.S. Cl. 123—478 **7 Claims**



1. A method of controlling an operating amount of an operation control means for controlling the operation of an internal combustion engine, wherein the operating amount of said operation control means is controlled in a first arithmetic manner to a first desired value determined on the basis of a first operating parameter of the engine when the engine is operating in a predetermined operating condition, while it is controlled in a second arithmetic manner to a second desired value determined on the basis of a second operating parameter of the engine when the engine is operating in a condition other than said predetermined operating condition, the method comprising the steps of:

(1) detecting the temperature of intake air being supplied to the engine;

(2) when the engine is operating in said predetermined operating condition, determining a first correction value appropriate to said first arithmetic manner, as a function of the detected value of the intake air temperature, correcting said first desired value of operating amount by the use of the determined first correction value, and controlling the operating amount of said operation control means to the corrected first desired value; and

(3) when the engine is operating in a condition other than said predetermined operating condition, determining a second correction value appropriate to said second arithmetic manner, as a function of the detected value of the intake air temperature, correcting said second desired value of operating amount by the use of the determined second correction value, and controlling the operating amount of said operation control means to the corrected second desired value.

4,549,519

METHOD FOR OPERATING AN APPARATUS FOR A FUEL CONTROL SYSTEM OF AN INTERNAL COMBUSTION ENGINE DURING OVERRUNNING

Michael Horbelt, Schwieberdingen; Hans Schnürle, Walheim; Peter Strauss, Leonberg, and Peter Werner, Wiernsheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

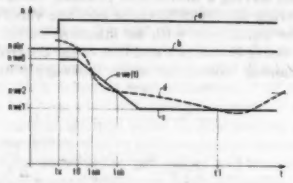
Filed Aug. 23, 1982, Ser. No. 410,669

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1981, 3134991

Int. Cl.⁴ F02D *5/02*

U.S. Cl. 123—493 **3 Claims**

1. A method for controlling the fuel metering system of an internal combustion engine during overrunning in accordance with the actual rpm and a reestablishment rpm threshold for the reestablishment of fuel metering, comprising the steps of, reducing the reestablishment rmp threshold below a predetermined actual rpm (n abr) according to a time function (n we(t)) from a high initial threshold value (n we0) to a low final value



(n we1), and interrupting the metering of fuel to the engine at rpm values above the reestablishment rpm.

4,549,520

BREATHING DEVICE FOR FOUR STROKE ENGINE

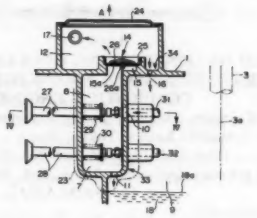
Shinichi Tamba, Kakogawa, and Takashi Mitadera, Akashi, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Jul. 27, 1984, Ser. No. 635,242

Claims priority, application Japan, Aug. 3, 1983, 58-121749[U]

Int. Cl.⁴ F01M *13/00*

U.S. Cl. 123—572 **3 Claims**



1. In a 4 stroke engine wherein the improvement comprises a breathing device, said breathing device comprising a first separating chamber for separating oil from air, said first separating chamber being formed as a tappet chamber having openings for receiving tappet shafts, a crank chamber, a vertical crank shaft in the crank chamber, a bearing for said crank shaft, a second separating chamber for separating oil from air provided above said crank chamber and said second separating chamber being positioned at a side of the bearing of the crank shaft, a first oil return port provided in the bottom of the first separating chamber for communicating with the crank chamber, a second oil return port provided in the bottom of the second separating chamber for communicating with the crank chamber, a first vent provided for communicating the crank chamber with the first separating chamber, a second vent for communicating the first separating chamber with the second separating chamber, a check valve arranged in the second vent for allowing air to flow only from the first separating chamber to the second separating chamber, and a third vent positioned above the second oil return port in the second separating chamber.

4,549,521

PLASTIC LID FLIPPER

Fred M. Hargrave, Jr., 408 Spencer Ave., Marion, Ind. 46952

Filed Jan. 4, 1985, Ser. No. 688,898

Int. Cl.⁴ A63B *65/00;* **F41B** *3/04;* **F41J** *9/18*

U.S. Cl. 124—5 **8 Claims**

8. A toy apparatus for flipping a lid having a flat major

portion and a peripheral rim attached to said major portion, comprising:

an elongate flat spring member having a top wall, sidewalls and a bottom wall;

a handle secured to a first end of said spring member;

a means for engaging said lid against a second end of said spring member, thereby permitting engaging and releasing said lip to flip said lid;

a shield for protecting said means for engaging attached to said second end, having a shoulder portion flush with said top wall, comprising a flat portion adjacent and below said engaging means and extending from a point between said two spring ends to beyond said engaging means; and

wherein said engaging means comprises a portion of said spring member bent away from the longitudinal axis of said spring member and having a common top wall with said spring member and narrower side walls than said spring member.

4,549,522

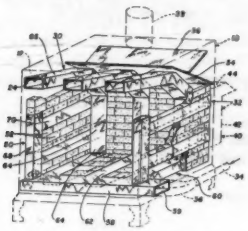
HEAT EXCHANGER FOR STOVES AND FIRE-PLACES

Germain Savignac, 26 Archambault St., St. Jean de Matha, Canada J0K 2S0

Filed Oct. 2, 1984, Ser. No. 656,991

Int. Cl.[4] F24B *7/00*

U.S. Cl. 126—72 **1 Claim**



1. In a stove, fire-place and the like heating apparatus, a combined fire-box and air-heat exchanger comprising a fire-box having a front wall, side walls, a floor and a top wall, said side walls, rear wall and floor being lined with fire bricks, said heat exchanger including a first network of air-circulating ducts inserted between the fire bricks lining said floor and said rear wall and having a face exposed within said fire-box, and a second network of air-circulating ducts inserted between the fire bricks lining said side walls and also having a face exposed within said fire-box, each duct of said first network being formed of legs at an angle to each other and forming a U-shape configuration; further including a manifold duct disposed transversely and in the front portion of the bricks lining the floor of said heating apparatus, said manifold in communication with said respective ducts at the forward end of the legs of said U-shape ducts, said U-shape ducts each defining a top leg extending from the rear wall to the front wall of said heating apparatus and spaced below the top wall of said heating apparatus and having an outlet at the front wall of said heating apparatus; said second network air-circulating ducts being all in substantially horizontal position and spaced apart from each other, said second network of ducts each further having a front inlet end and a rear outlet end, an upright manifold flush with the bricks lining the side walls of the heating apparatus in communication at their lower end with the first-named manifold and in communication with the inlet ends of said second network ducts, said outlet ends of said second network of ducts being disposed at the back of said heating apparatus, further including a collection chamber mounted at the back of said heating apparatus and communicating with the outlet ends of said second network of ducts, further including a first electric fan connected to the inlet of said first manifold for supplying cool air to said first manifold and a second air-circulating fan connected across said chamber, said chamber having an L-shape cross-sectional shape, said additional fan having an inlet connected with one leg of said L-shape chamber and an outlet connected with the other leg of said L-shape member; a distribution duct being also connected to said other leg of said distribution chamber, said distribution duct being adapted to distribute hot air to other rooms of a building to be heated by said heating apparatus.

4,549,523

HEATING APPARATUS

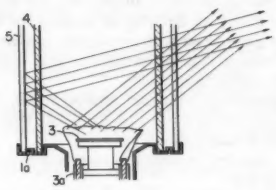
Yukio Hirauchi, Nara; Kazuhiro Nakano, Nabari, and Toyohei Harada, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 345,545, Feb. 3, 1982, abandoned. This application Sep. 4, 1984, Ser. No. 647,274

Claims priority, application Japan, Feb. 12, 1981, 56-19881; Feb. 23, 1981, 56-25875; Feb. 23, 1981, 56-25876; Feb. 23, 1981, 56-25877

Int. Cl.[4] F24C *5/06, 3/04*

U.S. Cl. 126—97 **7 Claims**



1. A heating apparatus comprising:

a combustion portion for forming a flame for generating heat and light;

an at least partially transparent cylindrical tube surrounding an outer periphery of said combustion portion; and

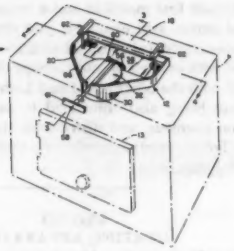
a cylindrical net-like member having a highly reflective mirror-like inner surface disposed on at least one of an outside and an inside of said cylindrical tube, said net-like member being disposed at a location spaced from said flame whereby it is prevented from making contact with said flame, and being made of 2 to 30 mesh lath net, a speckled pattern being visible when viewed along a horizontal direction from outside said apparatus by a combination of (i) light which passes through mesh frames of said net-like member on one side of said net-like member directly from said combustion portion and (ii) reflected light which is reflected by said highly reflective mirror-like inner peripheral surface of said net-like member on an opposite side of said net-like member and which then passes through said mesh frames on said one side, said mirror-like surface being oriented to reflect light from said combustion portion at an angle relative to said net-like member which is different from an angle of incidence relative to said net-like member light passing through said net-like member being visually overlapped when viewed during operation along a horizontal direction from outside said apparatus.

4,549,524

CATALYTIC UNIT FOR BURNERS

Peter S. Albertsen, Warwick, R.I., and Thomas Miller, Moncure, N.C., assignors to Nu-Tec Incorporated, East Greenwich, R.I.

Filed Mar. 12, 1984, Ser. No. 588,531
Int. Cl.[4] F23V *15/00*; F23L *11/00*
U.S. Cl. 126—289 5 Claims



1. Apparatus for supporting a catalytic converter for a burner comprising

a housing including means for mounting said housing in said burner in a position to receive exhaust gases of said burner, said means for mounting including a pair of hangers extending upwardly through an exhaust gas opening of said burner and having portions extending horizontally beyond said exhaust gas opening for hanging over the top of said burner, means for supporting a catalyst in a catalyst region, means for defining an opening for directing said exhaust gases to said catalyst region, and means for defining a by-pass opening permitting said exhaust gases to by-pass said cataylst region,

a baffle positioned over said catalyst region and having a groove formed in it and a tab extending from one end and adjacent to said groove,

a closure movably mounted to open and close said by-pass opening, and

a control rod slidably and pivotally mounted within said groove and having one end connected to said closure to open and close said by-pass opening by pivoting and having means for lockably engaging said tab by longitudinal displacement of said rod when in a pivotal position corresponding to a closed position of said closure, and another end having handle means for permitting pivoting and longitudinal displacement of said rod.

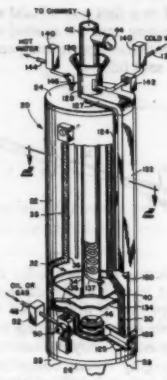
4,549,525

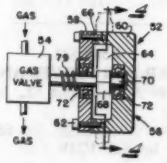
OIL AND GAS WATER HEATER

Rajendra K. Narang, 1525 Bonnie Rd., Macedonia, Ohio 44056

Filed Dec. 10, 1979, Ser. No. 101,873
Int. Cl.[4] F24H *1/14*
U.S. Cl. 126—361 15 Claims

1. A heater for fluids such as water comprising a storage tank for the fluid, said storage tank having a fluid inlet and outlet, burner means for buring fuel to heat the fluid in said storage tank, temperature responsive fuel control means operative to supply fuel to said burner means when the temperature of the fluid in said storage tank falls below a maintenance level to restore the temperature of the fluid in said storage tank to such maintenance level, and regulating means responsive to fluid flow through said stoage tank for controlling the quantity of





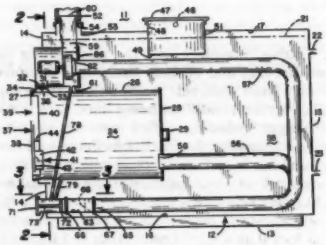
fuel supplied to said burner means by said temperature responsive fuel control means when operative.

4,549,526

COMBINATION WOOD-FIRED BOILER AND STORAGE APPARATUS

Martin R. Lunde, Minneapolis, Minn., assignor to Garn, Incorporated, Saint Paul, Minn.

Filed Mar. 31, 1983, Ser. No. 480,922
Int. Cl.[4] F24B *9/00*
U.S. Cl. 126—367 17 Claims



1. A combination solid-fuel burning liquid heating and thermal energy storage apparatus for storing heated liquid at temperatures suitable for the heating of room spaces and other uses during intervals of up to several days between intermittent burnings of successive fuel loads, said apparatus comprising a storage tank of substantial capacity having top, bottom, front, back, and side tank wall portions for containing a large volume of liquid, such as more than 1,000 gallons, to be heated and stored therein, the front wall portion having a single firebox opening therein spaced above the bottom tank wall portion, a

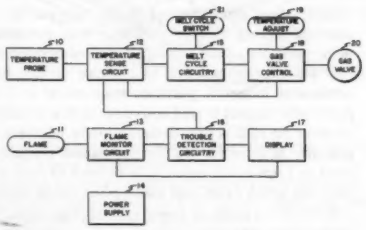
liquid-tight firebox fixed within said tank and having an open outer fuel-loading end accessible through the firebox opening, means providing liquid-tight engagement between the outer firebox end and the tank wall portion around the firebox opening, a firebox door member for selectively opening and closing said firebox open end, said firebox also having a main body portion within the tank including top, bottom, and side firebox wall portions and an inner firebox end wall portion opposite the outer firebox end, means supporting the firebox at a level above the bottom tank wall portion within the tank for substantially complete immersion of said firebox top, bottom, side and inner end wall portions within the tank liquid, means constantly venting the top of said storage tank to ambient pressure outside the tank and thereby holding the maximum tank liquid temperature close to the liquid boiling point at such ambient pressure and preventing increases of the internal tank pressure and external tank temperatures above safe levels with respect to any immediately adjacent building walls, an exhaust stack member extending outwardly from the inside to the outside of the tank, a flue assembly within the tank comprising at least one flue member extending circuitously through the tank liquid, the flue assembly having a flue inlet connected to receive gaseous combustion products from the firebox, a flue outlet connected to the exhaust stack, and heat transfer enhancing means for increasing the effective heat transfer from gaseous combustion products in the flue assembly to the liquid in such tank, said heat transfer enhancing means comprising at least one abrupt direction-changing, turbulence-generating heat exchange housing immersed in the tank liquid and having an inlet and an outlet serially connected in the flue assembly between the firebox and final exhaust stack, and blower means connected to at least one of said exhaust stack and flue assembly members for drawing a supply of combustion air into the firebox outer end and firebox, drawing the gaseous combustion products out of the firebox into the flue assembly and providing a forced discharge of such combustion products out of the exhaust stack during the burning of each successive fuel load, in which said one immersed turbulence-generating, heat exchange housing comprises a rotary blower fan housing for said blower means having an axial inlet and a tangential outlet, and in which said blower means includes a rotary fan in said rotary blower fan housing and motor means outside the tank connected through a tank wall portion for driving said rotary fan, thereby enhancing the transfer of thermal energy from the gaseous combustion products through the blower fan housing to the liquid in the tank and minimizing possible high temperature damage to the blower means, noise, and danger to nearby personnel.

4,549,527

SOLID STATE TEMPERATURE CONTROLLER

John Davis, Shreveport, La., assignor to The Frymaster Corporation, Shreveport, La.

Filed Jul. 8, 1983, Ser. No. 512,198
Int. Cl.[4] A47J *27/00*
U.S. Cl. 126—374 **15 Claims**



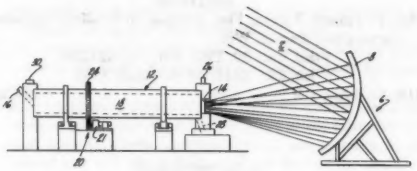
1. A temperature controller for a deep fat fryer comprising: a temperature sensing means for determining a temperature of cooking oil in the deep fat fryer and temperature control means connected to a deep fat fryer heat source for controlling the amount of heat provided to the cooking oil in response to a set temperature from an external input, said control means further including anticipation circuit means for variably modulating the heat source before the cooking oil temperature approaches the set temperature.

4,549,528

METHOD AND APPARATUS FOR SOLAR DESTRUCTION OF TOXIC AND HAZARDOUS MATERIALS

George W. Gibson, Delray Beach, Fla., assignor to Focus Environmental Systems, Ann Arbor, Mich.

Filed Feb. 21, 1984, Ser. No. 582,039
Int. Cl.[4] F24J *3/02*
U.S. Cl. 126—438 **40 Claims**



1. An apparatus for the destruction of toxic and hazardous materials having specific chemical bonding energies, comprising:

a reactor comprising a reaction chamber and defining a reaction zone within said reaction chamber;

a transparent window set in one surface of said reactor, said window being transparent to solar radiation at the wave lengths corresponding to the bonding energies of said materials;

means for collecting solar radiation, directing solar radiation into said reaction chamber through said transparent window, concentrating said solar radiation to within said reaction zone, and focusing solar energy in said reaction zone;

means for feeding toxic and hazardous materials into said reaction chamber of said reactor at said reaction zone;

means for controlling the rate of oxidation of said materials within said reaction chamber; and

means for withdrawing byproducts of said toxic and hazardous materials from said reaction chamber;

wherein the high intensity specific wave length energy present in said concentrated sunlight breaks chemical bonds in said toxic and hazardous materials and accelerates decomposition of the chemical compounds of said toxic and hazardous materials, degrading said compounds in direct proportion to the original concentration of the compounds.

4,549,529

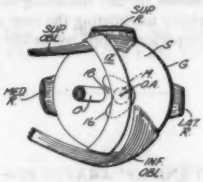
MYOPIA ALLEVIATION PROSTHESIS

Thomas C. White, 1127 Holly Dr., Sioux Falls, S. Dak. 57105

Filed Oct. 11, 1985, Ser. No. 540,344
Int. Cl.[4] A61B *19/00*; A61F *1/00*
U.S. Cl. 128—1 R **24 Claims**

21. A prosthesis to be surgically positioned about the globe of an eye, comprising an elongated strip of biologically accept-

able material having suturable ends and a length in the range of about 50–75 mm., and a pressure pad carried by the strip intermediate its length for bearing anteriorly against the eye wall obverse to the macula.

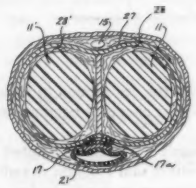


4,549,530

MALE URINARY INCONTINENCE DEVICE AND METHOD

Roy P. Finney, Tampa, Fla., assignor to Medical Engineering Corporation, Racine, Wis.

Filed Aug. 29, 1983, Ser. No. 527,291
Int. Cl.[4] A61B *19/00*; A61F *1/00*
U.S. Cl. 128—1 R **10 Claims**



1. A method of controlling urinary incontinence in a male patient which comprises implanting into the corpora cavernosum of the patient's penis relatively rigid backup support means of biocompatible material against which the urethra can be collapsed, anchoring said means to prevent it from migrating and then exerting selective pressure upon only one side of the urethra to collapse it and keep it closed against the backup support means.

4. A urinary incontinence device for a male patient comprising relatively rigid backup support means of biocompatible material for implanting in the corpora cavernosum of the penis of the patient to provide a support against which the patient's urethra can be collapsed, anchoring means for keeping said backup support means properly positioned in the penis, pressurizing means for selectively exerting pressure upon only one side of the urethra to collapse it and keep it closed against the backup support means and means for relieving the pressure exerted by the pressurizing means so that the urethra will open to permit fluid flow.

4,549,531

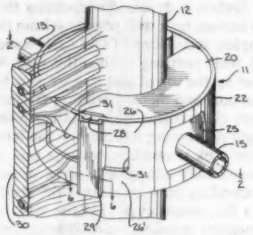
ARTIFICIAL SPHINCTER WITH INFLATABLE CUFF

Robert E. Trick, Racine, Wis., assignor to Medical Engineering Corporation, Racine, Wis.

Continuation of Ser. No. 371,529, Apr. 26, 1982, abandoned.
This application Aug. 3, 1984, Ser. No. 637,335
Int. Cl.[4] A61B *19/00*; A61F *1/00*
U.S. Cl. 128—1 R **1 Claim**

1. In an artificial sphincter having an inflatable cuff for closing off a body passage and fastening means for securing the cuff in position around the outer wall of the body passage, the improved fastening means which comprises:

(a) a flexible reinforcing belt for encircling the cuff and securing said cuff in place around the outer wall of the passage, said belt having an intermediate section of substantially uniform thickness throughout, and a pair of ends, at least one of said ends having a pair of relatively narrow spaced apart terminal flexible elongated fingers which can be threaded through the mesentery of the body passage so that they do not interfere with blood flow through the vessels which supply blood to the outer wall of the passage, said fingers, and the other end of said belt having enlarged beads, and



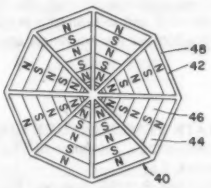
(b) a separate clip for securing the two ends of the belt together once it is in place, said clip having means for receiving and retaining the beads of the fingers and the other end of the belt.

4,549,532

FLEXIBLE MAGNETIC SHEET FOR THERAPEUTIC USE

Horst Baermann, Auf dem Saan 36, S-5064 Rosrath, Fed. Rep. of Germany

Filed Jul. 10, 1984, Ser. No. 629,364
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1983, 3325356; Aug. 29, 1983, 3331061
Int. Cl.[4] A61N *1/42*
U.S. Cl. 128—1.3 **16 Claims**



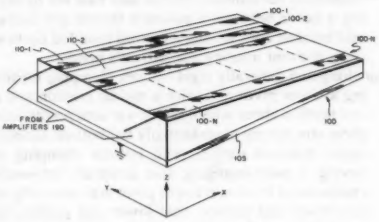
1. A flexible magnetic sheet for therapeutic use by application to a body site comprising:

a flexible sheet composed of a skin compatible synthetic material having an active surface with permanent magnetic particles of a ferrite material embedded therein; a first plurality of areas on said active surface having the permanent magnetic particles magnetized to form north poles with respect to said active surface; a second plurality of areas on said active surface closely adjacent said first plurality of areas having the permanent particles magnetized to form south poles with respect to said active surface, the north poles and south poles being arranged in a concentric, angular or radial geometrical pattern thereby establishing magnetic fields having angularities with respect to a line traversing the active surface such that alternating polarities will be traversed by blood flow vessels notwithstanding universal orientation of the body means on the body site.

4,549,533
APPARATUS AND METHOD FOR GENERATING AND DIRECTING ULTRASOUND

Charles A. Cain, Urbana, and Leon A. Frizzell, Champaign, both of Ill., assignors to University of Illinois, Urbana, Ill.

Filed Jan. 30, 1984, Ser. No. 574,930
Int. Cl.[4] A61B 5/00; A61H 1/00
U.S. Cl. 128—24 A 31 Claims



1. Apparatus for generating and directing ultrasound at target positions, comprising:

a plurality of side-by-side piezoelectric transducer elements, each of said elements having tapered thicknesses;

variable frequency energizing means for energizing said transducer elements with electrical energy having a variable frequency;

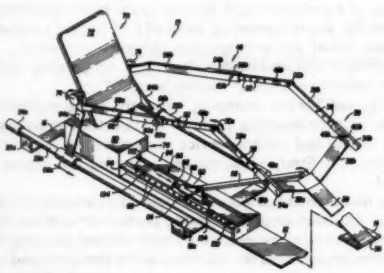
means for controlling the frequency of said electrical energy so as to vary the target position of the ultrasound produced by said transducer elements along the direction of taper of said elements; and

means for electronically varying the target position of the ultrasound produced by said transducer elements along a direction perpendicular to said direction of taper.

4,549,534
LEG EXERCISE DEVICE

Joseph B. Zagorski, 440 Castania, Coral Gables, Fla. 33134, and Stephen C. Roy, 3010 Saint James Dr., Boca Raton, Fla. 33434

Filed Jan. 13, 1983, Ser. No. 457,516
Int. Cl.[4] A61H 1/02
U.S. Cl. 128—25 R 10 Claims



1. A continuous passive motion exercise device for the lower extremity of a user comprising:

an elongated flat base having a proximal end and a distal end, said base being disposed in a horizontal plane and having a longitudinal axis and a lateral axis;

a thigh support means for engaging the thigh of the user having a proximal end pivotably mounted to the proximal end of said base about a pivot axis parallel to the lateral axis, said thigh support means including two thigh bars located on respective lateral sides of the longitudinal axis of said base having proximal ends and distal ends and a thigh adjusting means for adjusting the distance between the distal ends of said thigh bars and the proximal end of said thigh support means;

a lower leg support means for engaging the lower leg of the user having two lower leg braces located on respective lateral sides of the longitudinal axis of said base having proximal ends and distal ends, said proximal ends of said lower leg braces being pivotably attached to the distal ends of respective said thigh bars about a pivot axis adjacent the knee of the user and said distal ends of said lower leg braces being located above said base, said lower leg support means also including a lower leg adjusting means for adjusting the lengths of said lower leg braces;

a sliding bearing means located slightly above said base for providing a smooth sliding support along an axis parallel to the longtudinal axis of said base for said distal ends of said lower leg braces, said sliding bearing means including

two longitudinal bearing rods having a circular cross section and located slightly above respective lateral sides of said base,

two cylindrical bearing members slidingly mounted on respective ones of said bearing rods, and

two mounting braces attached to respective said cylindrical bearings at one end and extending upwardly therefrom;

a lower leg pivot means for pivotally mounting said distal ends of said lower leg braces relative to the other ends of said mounting braces about a pivot axis parallel to the lateral axis and located adjacent the foot of the user;

a thigh brace having a proximal end which is pivotally attached to said thigh support means and whose distal end extends below said lower leg support means;

an enclosed motor means immovably attached adjacent to the distal end of said base for moving a motor member longitudinally of said base, said motor member including a motor pivot means for pivotally attaching the distal end of said thigh brace to said motor member about a pivot axis parallel to the lateral axis whereby actuation of said motor means causes the angle formed between said thigh support means and said lower leg support means to vary;

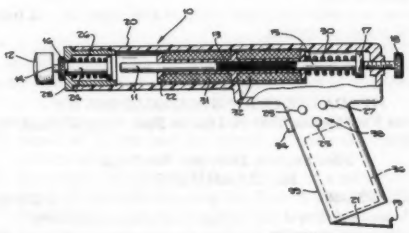
a motor cycling means for reversing the longitudinal movement of said motor member when the angle between said thigh support means and said lower leg support means reaches a predetermined minimum and maximum; and

an motor adjustment means for ajustably controlling the motor cycling means so as to adjust the minimum and maximum angles.

4,549,535
LINEAR MOTOR MASSAGE APPARATUS

Thomas W. Wing, 900 E. Holt Ave., Pomona, Calif. 91767

Filed Dec. 6, 1982, Ser. No. 447,151
Int. Cl.[4] A61H 7/00, 23/00
U.S. Cl. 128—55 3 Claims



1. Linear motor massage apparatus, comprising:

a housing having a handle;

an electronically controlled linear motor secured in said housing having an elongated cylindrical member comprising a central elongated cylindrical armature fabricated of magnetic metal abuttably joined at one end to an elongated cylindrical main shaft impact tip fabricated of non-magnetic metal of even cross section with said armature so as to be coaxial therewith, said armature joined at its other end to an elongated cylindrical main shaft extension also fabricated of non-magnetic metal and also of even cross section with said armature so as to be coaxial therewith, said extension being terminated at its end distal from said armature by a main shaft head;

a cylindrical nylon bobbin in said housing having a hollow core, a forward outer surface annular compartment and a rearward outer surface annular compartment, said elongated cylindrical member being slideably disposed in said hollow core;

two solenoid coils, a first one wound upon said forward outer surface annular compartment of said hollow cylindrical nylon bobbin and the other, a second solenoid coil, wound upon said rearward outer surface annular compartment of said nylon bobbin;

an anvil in said housing in coaxial alignment with said elongated cylindrical member and arranged so as to be struck at one end by said main shaft impact tip during operation of said linear motor;

means for supporting said anvil in said housing, comprising:

a retract spring adjustment member threadedly secured to said housing;

a retract spring resiliently retained between said spring adjustment member and said anvil;

a knurled shoulder nut return stop;

a soft tip shaft adapted by means of a spring slot to be frictionally retained in said anvil;

a return spring resiliently retained on said main shaft extension between one end of said bobbin and said main shaft head for retracting said elongated cylindrical member;

a knurled nut stop adjustment screw for adjusting the mechanical stroke of said elongated cylindrical member;

an electric power supply situated in said handle and adapted to supply operating power to said electronically controlled linear motor;

electronic control means comprising:

a trigger switch having at least two positions, a first one of which positions applies electric power from said electric power supply to said first solenoid coil for a preselected duration time;

an electronic control circuit to control said preselected duration time;

a second one of which positions of said trigger switch applies electric power from said electric power supply to an electronically controlled transistor switching circuit such that electric power is supplied alternately to said first solenoid coil and then to said second solenoid coil in the form of a continuous train of pulses;

means to control the amplitude of the train of electric pulses so applied;

means to control the frequency of said train of pulses so applied; and

means to control the pulse width of said pulses in said train of pulses so applied.

4,549,536

HEADACHE CURING MEDICAL DEVICE

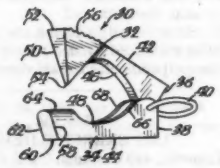
Shanoor Varjabedian, 1969 N. Lincoln Park West, Chicago, Ill. 60614

Filed Sep. 19, 1983, Ser. No. 533,127
Int. Cl.[4] A61H *39/04*
U.S. Cl. 128—60 **5 Claims**

1. A medical device for curing headaches, comprising:

an elongated generally rigid top clamping member having an upper pivot arm with a middle portion and an upper end portion about which said upper arm pivots, said upper pivot arm having a substantially flat top surface and a lower concave surface, said top clamping member having an inverted generally pyramid-shaped head integrally connected and cantilevered from said upper pivot arm generally opposite said upper end portion, said upper end portion and said head each spanning a height greater than the thickness of the middle portion of said upper pivot arm, said pyramid-shaped head having an upper manually depressable base with upwardly extending finger-gripping ribs and a lower downwardly extended blunted apex positioned substantially below said base for firmly engaging a nerve between a patient's thumb and index finger, said blunted apex having a curved rounded tip to substantially prevent injuring the patient's hand;

an elongated generally rigid bottom clamping member having a lower pivot arm with a middle portion and a lower end portion about which said lower arm pivots, said lower pivot arm having a substantially flat bottom surface and an upper concave surface, said bottom clamping member having a palm-engaging seat integrally connected and cantilevered from said lower pivot arm generally opposite said lower end portion, said lower end portion having a greater height than said seat, said lower end portion having a generally U-shaped cross-section defining a pocket for slidably receiving said upper end portion of said upper clamping member, said seat spanning a height greater than the thickness of the middle portion of said lower pivot arm, said palm-engaging seat having a lower manually depressable base and an upper elongated, arcuate engaging portion for firmly engaging the palm of the patient's hand, said arcuate engaging portion having a generally



convex top surface to substantially prevent injuring said hand;

connecting means for pivotally connecting said end portions of said top and bottom clamping members;

said connecting means and said clamping members each being of a generally rigid, medical grade material selected from the group consisting esentially of impact resistant plastic, metal, and combinations thereof;

said top and bottom clamping members cooperating with each other to provide pivotable jaws;

said top and bottom clamping members being moveable from an open inserting position for inserting, removing, and storing said medical device to a contracted engaging position for firmly engaging and clamping the patient's hand;

said tip of said head being normally spaced from and cooperating with said arcuate engaging portion of said seat to define a mouth therebetween, said mouth spanning a distance greater than the thickness of the patient's hand in said open inserting position, but less than the thickness of the patient's hand in said contracted engagin position;

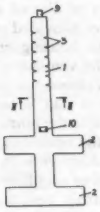
said tip of said head being in substantial vertical alignment and registration with said arcuate engaging portion of said seat in said closed engaging position; and

said upper and lower concave surfaces of said pivot arms having a configuration generally complementary to the external shape of the patient's hand between the patient's thumb and index finger and cooperating with each other to define an access opening for receiving the web of the patient's hand between the patient's thumb and index finger in said closed engaging position.

4,549,537
SPLINT FOR REDUCING AND MAINTAINING MOTIONLESS FRACTURES OF FINGERS AND THE METACARPUS AND PROCESS FOR PRODUCING SUCH A SPLINT

Hans G. Ender, Ferstelgasse 6/20, A-1090 Vienna, Austria

Filed Apr. 17, 1981, Ser. No. 255,318
Claims priority, application Austria, Apr. 25, 1980, 2252/80
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—87 A 15 Claims



1. A splint for reducing and for maintaining in motionless position fractures of fingers and the metacarpus comprising:

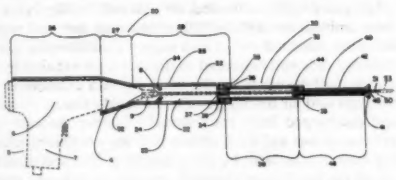
a flat elongated base strip of plastically deformable material, said strip being movable in perpendicular direction to its plane, said strip being twistable around its longitudinal axis and said strip being provided on both opposing longitudinal edges with gaps such that is can be transversely bent in its own plane,

and at least one transverse member being fixedly connected at one end portion of the base strip and being adapted to be bent in a direction perpendicular to its surface around the fore-arm for fixing the splint.

4,549,538
PIN INSERTER SHEATH

William C. Schadrack, III, Memphis, Tenn.; Robert W. McQueen, Warsaw, Ind., and Joyce K. Eyerly, White Bear Lake, Minn., assignors to Zimmer, Inc., Warsaw, Ind.

Filed Nov. 12, 1982, Ser. No. 441,199
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—92 EB 5 Claims



1. A pin inserter sheath for attachment to a pin drilling device, the device including a main body and a handle attached thereto, said sheath comprising:

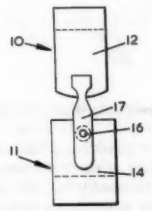
(a) a proximal portion adapted for attachment to the pin drilling device; and

(b) at least one member attached to said proximal portion and having a channel therethrough for receiving a pin therein, and for providing lateral support to at least a portion of the received pin, said member having an outlet continuous with said channel for protrusion of the pin therefrom, said member being retractable into said proximal portion and slideable along said pin while providing lateral support, and wherein said proximal portion includes a means for securing the sheath externally onto the body of the drilling device, said means including an elongated stabilizing portion which extends substantially over the upper portion of the main body of the drilling device and further attached to the drilling device by a thin, extended securing ring, said ring including a gap in the ring enabling the ring to snap securely about the proximal end of the main body of the drilling device.

4,549,539
METHOD FOR PROTECTION OF THE EYE

William B. M. Donaldson, 45 Carlton Pl., Aberdeen, AB2 4BR, Scotland

Filed Jun. 23, 1983, Ser. No. 507,106
Claims priority, application United Kingdom, Jul. 3, 1982, 8219300
Int. Cl.[4] A61F *13/00*
U.S. Cl. 128—132 R 2 Claims

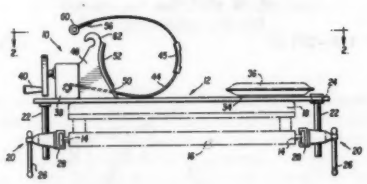


1. A method for treatment of the eye, closure thereof between exposures of the eyeball for examination and treatment is effected by fastening means interconnecting first and second elements one of which is attached to the upper eyelid and the other of which is attached to a part of the cheek below the eye, the fastening means being adapted for repeated opening and reclosing to enable repeated ready access to the eye and repeated reclosure thereof.

4,549,540
THIGH RESTRAINING APPARATUS AND METHOD

Richard B. Caspari, Maidens; Terry L. Whipple, and James A. Thimsen, both of Richmond, all of Va., assignors to Precision Surgical Instruments, Inc., Richmond, Va.

Filed Nov. 16, 1983, Ser. No. 552,375
Int. Cl.[4] A61F *13/00*
U.S. Cl. 128—133 10 Claims



1. A thigh restraining apparatus for use in conjunction with an operating table, said operating table having a pair of horizontally extending rail means on opposed sides of said operating table, said apparatus comprising:

a. bar means extending across said operating table,

b. means to secure said bar means to said rail means on opposed sides of said operating table,

c. tourniquet means applied to the thigh of a patient to be operated upon for stopping the flow of blood in the patient's leg,

d. feed means mounted on said bar means to advance and retard one end of strap means adapted to envelop said tourniquet means,

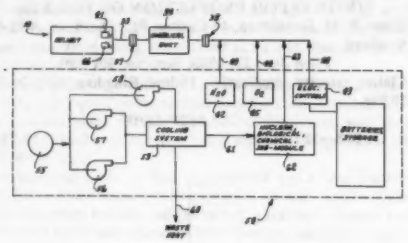
e. and means for holding said one end of said strap means.

4,549,541

HELMET SYSTEM

James G. Sundahl, Irvine, Calif., assignor to Bell Helmets Inc., Norwalk, Calif.

Filed Sep. 28, 1983, Ser. No. 536,282
Int. Cl.⁴ A62B 7/00
U.S. Cl. 128—201.19 **13 Claims**



1. In a protective helmet system, the combination comprising:

(a) a protective helmet including a hard outer shell and an impact absorbing liner at the inner side of the shell, the helmet defining a forwardly located viewing gap, and visor means movably mounted on said helmet to extend, over said gap,

(b) the helmet having shroud means to seal off between the helmet and the wearer, thereby to isolate the helmet interior from the exterior,

(c) the helmet having inlet port means for entering fluids,

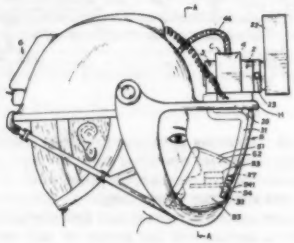
(d) and including exterior duct means connected with the helmet to supply said fluids via said inlet port means, said duct means including a flexible first duct connected to said inlet port means to supply pressurized air to the interior of said helmet, a second duct to supply water and a third duct to supply oxygen, said second and third ducts extending within said first duct to the interior of said helmet in the vicinity of said gap, and means connected to said second and third ducts for selectively delivering said water and oxygen to a user.

4,549,542

MULTIPLE-EFFECT RESPIRATOR

Chao-Huei Chien, P.O. Box 10160, Taipei, Taiwan

Filed Jul. 25, 1983, Ser. No. 516,687
Int. Cl.⁴ A62B 7/00
U.S. Cl. 128—201.24 **3 Claims**



1. A multiple effect respirator comprising:

a driving motor having a shaft extending through opposite sides of said motor adapted for receiving fans thereon;

a supplying air fan fixed on the motor shaft on one side of said motor;

an exhausting air fan fixed on the motor shaft on the opposite side of said motor;

two ventilating fans fixed on the motor shaft at opposite sides of the motor, respectively, and adjacent thereto;

a housing having first and second opposite end walls and side wall means extending therebetween, said end walls and side wall means defining a chamber therebetween, said fans and said motor mounted within said chamber with said exhausting fan and said supplying fan adjacent the first and second opposite end walls, respectively, said first end wall having exhaust means therein for permitting discharge of air from the exhausting fan and said second end wall having filtering means connected thereto for permitting delivery of filtered air to said supplying fan, said housing further provided with first partition means mounted within the housing chamber between said exhausting fan and the ventilating fan adjacent thereto for defining an exhaust chamber with the side wall means and the first end wall of said housing and second partition means mounted within the housing chamber between said supplying fan and the ventilating fan adjacent thereto for defining a supply chamber with the side wall means and the second end wall of said housing, said first and second partition means further defining a ventilating chamber between the exhaust chamber and supply chamber, said exhaust chamber having an air inlet therein, said supply chamber having an air outlet therein and said ventilating chamber having an air inlet in fluid communication with ambient and an air outlet therein;

a helmet adapted to cover the top of user's head having

a front portion and a rear portion adapted for positioning adjacent the front and rear portions of a user's head, respectively, said housing mounted on the front portion of said helmet, said helmet provided with a facepiece pivotally mounted across the front portion thereof and adapted to overlie the user's face in spaced relationship thereto, said facepiece having an oronasal mask adapted to cover the user's nose and mouth mounted thereon at the portion of said face piece adapted to overlie the nose and mouth of the user; a power source electrically connected with said motor and mounted on the rear portion of the helmet;

an air delivery tube connected to the outlet of said supply chamber and the mask on said facepiece;

an air discharge tube connected to the air inlet of said exhaust chamber and the mask on said facepiece; and air delivery means connected to the outlet of the ventilating chamber and the helmet for delivering of air from the ventilating chamber to the interior of the helmet, whereby when said motor is actuated, air is drawn by supplying fan from ambient through said filtering means into said supply chamber, directed out of said supply chamber into the air delivery tube and delivered to the mask, air exhaled by the user is withdrawn from the mask by said exhausting fan through said air discharge tube into said exhaust chamber and discharged from the exhaust chamber through said exhaust means and air is drawn into the ventilating chamber from the ambient by the ventilating fans and directed out of the ventilating chamber into the air delivery means and delivered to the helmet.

4,549,543

AIR FILTERING FACE MASK

William F. Moon, P.O. Box 192, Buchanan, Mich. 49107

Filed Dec. 1, 1982, Ser. No. 446,045
Int. Cl.⁴ A62B 7/10
U.S. Cl. 128—206.12 **4 Claims**

1. In a respirator including a face piece for positioning about the face of a user in marginal edgewise contact with the face of the user, said face piece defining a cavity into which air may be drawn, said face piece having an intake opening formed therein, a filtering means secured to said face piece at said intake opening for purifying air as it is drawn into said cavity, harness means for securing said face piece in said marginal contact position upon the face of a user, and exhaust means positioned on said face piece for allowing the expulsion of

waste gases from said cavity, the improvement wherein said face piece and harness means are formed of flexible transparent material, said filtering means being located under the lower portion of said face piece in substantially horizontal position when worn for minimizing visual appearance as the respirator is worn so as to enhance the cosmetic value of the respirator, said exhaust means being located above and spaced from said filtering means, said exhaust means comprising two spaced adjacent exhaust openings and a flexible transparent sheet

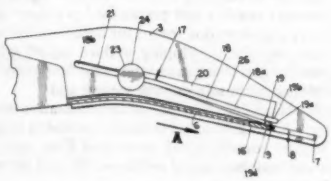
valve member overlying said exhaust openings and being anchored to the exterior of said face piece at the portion thereof between said adjacent exhaust openings, said valve member spanning said adjacent exhaust openings upon inhalation by said user and flexing to an open position upon exhalation, and a transparent retainer strap having two opposite ends is anchored to said face piece at said ends overlying and spanning the portions of said sheet valve member and said face piece between said adjacent openings.

4,549,544

CLIP STOP FOR A SURGICAL LIGATING INSTRUMENT

James A. Favaron, Amelia, Ohio, assignor to Senmed, Inc., Cincinnati, Ohio

Filed Oct. 31, 1983, Ser. No. 546,928
Int. Cl.[4] A61B *17/08*; B65H *25/26*
U.S. Cl. 128—335 **17 Claims**



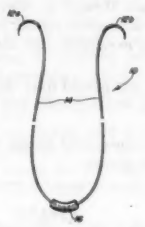
1. A surgical instrument for applying hemostatic clips to vessels within a patient, comprising: first and second jaws having opposed clamping surfaces for clamping said clips to a vessel; means for actuating said jaws between a first normal open position and a second clip-clamping position; means for storing a plurality of said clips within said instrument; means for transferring said clips one at a time to said jaws from said storage means; and stop means located totally within said clamping jaws for allowing a clip to be transferred from said storage means to said clamping jaws while preventing said clip from moving toward said storage means during the operation of said actuating means.

4,549,545

SEGMENTED POLYURETHANE SURGICAL BUTTRESSING PLEDGETS

Alan J. Levy, Bridgewater, N.J., assignor to Ethicon Inc., Somerville, N.J.

Filed Mar. 5, 1984, Ser. No. 586,462
Int. Cl.[4] A61K *17/00*; A61B *17/04*
U.S. Cl. 128—335 **11 Claims**



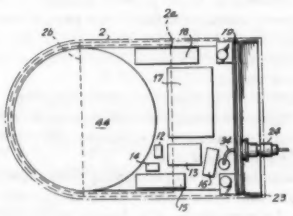
1. A suture/pledget combination comprising a suture threaded through a perforated pledget, wherein the pledget comprises a mat of continuous filament microfibers, wherein said microfibers consist essentially of a segmented urethane polymer comprising the reaction product of a polyether or polyester glycol having a molecular weight of at least about 200, an organic diisocyanate, and a difunctional extender.

4,549,546

BONE GROWTH STIMULATOR

P. Richard Kelly, Hales Corner, and John N. Pedersen, New Berlin, both of Wis., assignors to Telectronics Pty. Ltd., Lane Cove, Australia

Filed Dec. 30, 1983, Ser. No. 567,170
Int. Cl.[4] A61N *1/20*
U.S. Cl. 128—419 F **4 Claims**



1. In an implantable bone growth stimulator, said stimulator being encapsulated in a case made of metal which case functions as the stimulator housing, a constant current source in the case, at least one cathode lead electrically connected to the current source, there being an electrical connection between the stimulator housing and the current source, and there being electronics in the case electrically connected to the power source; the improvement comprising:

said case being thin walled, and having a flat-sided shape of substantially rectangular cross-section, said case being defined by a pair of substantially parallel top and bottom walls, there being opposed side walls extending between said top and bottom walls and being substantially narrower than said top and bottom walls, and opposed end walls, a first said end wall being substantially smaller than said side walls;

said first end wall comprising a top cap welded to adjacent edges of the adjacent top, bottom and side wall edges to form a hermetic seal over said electronics and said current source contained within the case;

a feed-through assembly welded to the top cap and interconnected to said at least one cathode lead and the contained current source, the feed-through assembly being longitudinally off center of the top cap;

brace means substantially rigidly interconnected between the top cap and adjacent walls of the case internally of the case which they form, constructed and arranged to provide a positive ground for the unit and protect the top cap from distortion thereof in relation to the adjacent side walls, said brace means further constructed and arranged to counteract expansion and contraction of the adjacent parts;

an elastomer top placed over the feed-through assembly, there being means joining said elastomer top to the top cap; and

an electrically-insulating plastic boot and insulator about the current source.

4,549,547

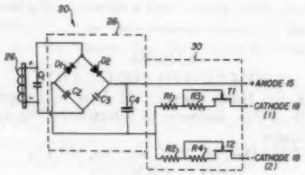
IMPLANTABLE BONE GROWTH STIMULATOR

Carl T. Brighton, Malvern; Jonathan Black, King of Prussia, both of Pa., and William Redka, Vineland, N.J., assignors to Trustees of the University of Pennsylvania, Philadelphia, Pa.

Filed Jul. 27, 1982, Ser. No. 402,316

Int. Cl.⁴ A61N *1/08*

U.S. Cl. 128—419 F **12 Claims**



1. An implantable bone growth stimulator, powered by electromagnetic radiation external to a patient, said stimulator comprising:

at least one cathode;

at least one anode;

means for receiving electromagnetic radiation;

means, responsive to said receiving means, for rectifying said received electromagnetic radiation, said rectifying means including an output; and

means, responsive to said rectifying means output and connected to said at least one cathode and to said at least one anode, for maintaining at a desired substantially constant level one of voltage and current supplied between said at least one cathode and said at least one anode.

4,549,548

PACEMAKER SYSTEM WITH AUTOMATIC EVENT-PROGRAMMED SWITCHING BETWEEN UNIPOLAR AND BIPOLAR OPERATION

Frederik H. M. Wittkampf, Brummen, and Willem Boute, Doesburg, both of Netherlands, assignors to Vitafin N.V., Curacao, Netherlands

Filed Sep. 14, 1983, Ser. No. 532,184

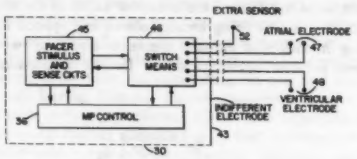
Int. Cl.⁴ A61N *1/36*

U.S. Cl. 128—419 PG **15 Claims**

1. Pacemaker apparatus having an implantable pacemaker, said pacemaker having stimulus means for generating stimulus pulses, sensing means for sensing heart signals, and cyclic means for controlling said pacemaker to carry out cyclic operation, a lead with at least two spaced lead electrodes thereon, and an indifferent electrode, comprising:

connection means for controllably connecting said sensing means and said stimulus means to respective selected ones of a plurality of combinations of said lead electrodes and said indifferent electrode;

selection means for selecting respective first and second ones of said combinations for sensing of respective heart signals



at different times during a cycle of pacemaker operation; and

control means for controlling said connection means in accordance with said selected combinations

---

4,549,549

ELECTRONIC SPHYGMOMANOMETER

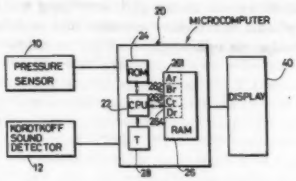
Toshio Furukawa, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 6, 1984, Ser. No. 577,483

Claims priority, application Japan, Feb. 14, 1983, 58-22608

Int. Cl.⁴ A61B *5/02*

U.S. Cl. 128—680 **14 Claims**



1. In an electronic sphygmomanometer which measures the systolic pressure and the diastolic pressure while a cuff pressure gradually changes, a measuring control circuit comprising:

storage means for storing a preselected pressure value;

control means for developing a first control signal before the cuff pressure reaches said preselected pressure value during the course of the gradual changing of the cuff pressure, and for developing a second control signal after the cuff pressure reaches said preselected pressure value;

auscultatory gap detection means for detecting the auscultatory gap and for developing a third signal when said auscultatory gap is detected while said first control signal is developed from said control means; and

Korotkoff sound detection period determination means for varying a Korotkoff sound detection period in response to said second control signal developed from said control means and said third signal developed by said auscultatory gap detection means.

4,549,550

SPHYGMOMANOMETER

Tomohiro Kami, Hikone, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Apr. 3, 1984, Ser. No. 596,261

Claims priority, application Japan, Jun. 15, 1983, 58-106890

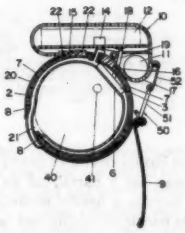
Int. Cl.⁴ A61B *5/02*

U.S. Cl. 128—686 **4 Claims**

1. A sphygmomanometer comprising:

a main body having thereon display means for indicating the blood pressure detected thereby;

an arm engaging resilient retainer connected to a bottom wall of the main body for retaining such main body in positive arm engaging disposition on a single arm of the user, said arm engaging resilient retainer being curved to be arcuate in cross section to be adapted to the arm, said arm engaging resilient retainer further being formed with a plurality of circumferentially extending slits which divide the end portions on both sides of the retainer into a plurality of resilient wings capable of flexing relatively freely;



a wrap-around cuff carried by said retainer and provided with an inflatable bag which extends along the circumference of the inside of said resilient retainer and which incorporates therein a sound sensor, said sound sensor being connected to the display means; and

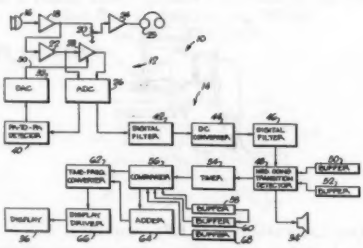
fastening means provided on the cuff for holding the cuff in a fixed position of being wrapped around the arm of the user.

4,549,551

HEART RATE DETECTOR

Walter R. Dyck, and Ronald A. Eirich, both of Medicine Hat, Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defense, Ottawa, Canada

Filed Nov. 18, 1983, Ser. No. 553,116
Claims priority, application Canada, Nov. 24, 1982, 416203
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—689 **7 Claims**



1. An electronic heart rate detector, comprising:

a transducer for converting sounds to electrical signals;

a first amplifier for amplifying said electrical signals and producing first amplified electrical signals;

a second amplifier for amplifying said first amplified electrical signals, a second transducer for converting said second amplified electrical signals to sounds;

a low pass filter having an upper cut-off frequency of 25 Hz for filtering said first amplified electrical signals and providing filtered electrical signals;

a variable gain amplifier for amplifying said filtered electrical signals and providing amplified filtered electrical signals, said variable gain amplifier maintaining the amplitude of said amplified electrical signals within predetermined limits;

means for sampling said filtered electrical signals and said amplified filtered electrical signals at a predetermined sampling frequency and producing a first series of digital signals representative of said filtered electrical signals and a second series of digital signals representative of said amplified filtered electrical filters;

means responsive to said first series of digital signals for detecting the peak-to-peak value thereof and providing a gain control signal to said variable gain amplifier;

first digital filter means for filtering said second series of digital signals and providing a series of once filtered digital signals, said first filter means having a passband of about 16 Hz to 42 Hz;

converter means for converting said series of once filtered digital filters to a series of DC signals;

second digital filter means for filtering said series of DC signals and providing a series of filtered DC digital signals;

a first comparator for comparing each signal of said series of filtered DC signals with its immediately preceding signal and producing a clock signal indicative of a negative-going transition when the magnitude of said most recent signal is less than the magnitude of its immediately preceding signal;

timer means responsive to said first detector means output signal for producing signals representative of the time interval between negative-going transitions;

second comparator means for comparing a most recent timer means output signal against immediately preceding output signal and providing a first output signal representative of a heart rate when said most recent timer means signal and its immediately preceding signal are substantially the same and a second output signal representative of the sum of said timer means output signals when said timer means signals are substantially different; and

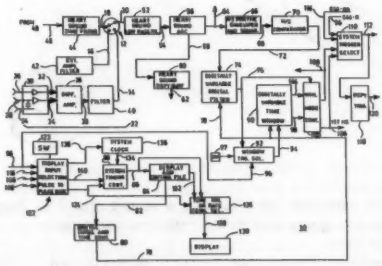
means for displaying said first or said second comparator means output signals as a BPM heart rate count.

4,549,552

HEART SOUND DETECTOR AND CARDIAC CYCLE DATA ARE COMBINED FOR DIAGNOSTIC RELIABILITY

Mark W. Groch, Elk Grove, and James R. Domnanovich, Roselle, both of Ill., assignors to Siemens Gammasonics, Inc., Des Plaines, Ill.

Division of Ser. No. 241,388, Mar. 6, 1981, Pat. No. 4,496,873.
This application Feb. 23, 1984, Ser. No. 583,082
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—700 **12 Claims**



1. Apparatus for detecting heart sounds and for generating accurately timed heart sound reference signals, the apparatus including first and second heart sound inputs, the apparatus comprising:

(a) means responsive to representations of heart sound signal inputs for generating at least one heart sound output signal

coincident with systole at a first signal output in accordance with the timing relationship between said received heart sound signal inputs;

(b) means for establishing a heart sound enable time window in response to a first received heart sound signal input;

(c) means responsive to said heart sound enable time window and said heart sound signal inputs for generating said systole heart sound output signal in response to a received heart sound signal input occurring during said heart sound enable time window;

(d) window setting means for variably programming predetermined heart sound enable time windows in said heart sound enable time window establishing means in accordance with predetermined detected timing relationship between received heart sound signal inputs, wherein said window setting means comprises means responsive to said heart sound signal inputs determining a predetermined timing relationship and generating a data output, and means responsive to said data output for outputting window setting control signals to said heart sound enable time window establishing means; and

(e) input selection means for selectively providing first and second trigger signals as respective start and stop signals to said timing relationship and data output generating means, said timing relationship and data output generating means providing said detected timing relationship in response to said first and second trigger signals as a representation of the time interval between said respective start and stop signals;

wherein said input selection means includes an ECG R-wave signal input among a plurality of predetermined, signal inputs said heart sound output generating means further comprising means for generating at a second signal output a heart sound output signal coincident with diastole, said first and second heart sound signal outputs being provided as inputs to said selection means.

4,549,553

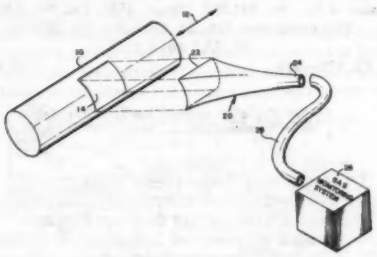
APPARATUS AND METHOD FOR USE IN A MEDICAL GAS SAMPLING SYSTEM

Howard M. Hochberg, Woodinville, Wash., assignor to Spacelabs, Inc., Chatsworth, Calif.

Filed Nov. 7, 1983, Ser. No. 549,027

Int. Cl.[4] A61B *5/08*

U.S. Cl. 128—719 **6 Claims**



1. An apparatus for obtaining a sample gas flow from a patient undergoing automatic ventilation comprising:

an air tube;

a gas diffusive membrane disposed within the wall of said air tube;

a funnel comprising:

a base coupled directly to said air tube such that the interior of said air tube communicates with the interior of said funnel through said gas diffusive membrane; and

a tubular shaped end portion opposite said base and disposed to be coupled to a gas monitor, the cross section of said tubular shaped end portion being substantially smaller than the cross section of said base.

4,549,554

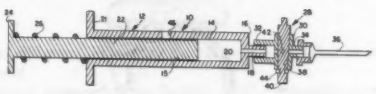
ASPIRATION BIOPSY DEVICE

Charles W. Markham, 667 Snug Island, Clearwater, Fla. 33515

Filed Jan. 3, 1984, Ser. No. 567,734

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—753 **14 Claims**



1. An aspiration biopsy device of modified syringe construction, which syringe has a barrel, an air tight telescopically mounted piston therein, a needle mounted at the end of the barrel opposite its needle-mounting end, wherein the improvement comprises a holding means for holding said piston in a vacuum creating position intermediate the ends of the barrel, first open shut valve means for selectively opening and closing said barrel from a needle mounted on said device, and a second open shut valve means for selectively venting any vacuum which might exist between the inner end of said piston and said first valve means, and said holding means comprising an operator-controlled selectively engageable and disengageable physical stop means acting between said piston and said barrel.

4,549,555

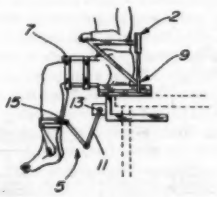
KNEE LAXITY EVALUATOR AND MOTION MODULE/DIGITIZER ARRANGEMENT

Gregory A. Fraser, Montreal, and Simon Raab, Lorraine, both of Canada, assignors to Orthothronics Limited Partnership, Canada

Filed Feb. 17, 1984, Ser. No. 581,432

Int. Cl.[4] A61B *5/10*

U.S. Cl. 128—782 **7 Claims**



1. A knee laxity evaluator (KLE) comprising:

(a) a seat, said seat including a dynamometer means for measuring forces applied to said seat by a seated patient;

(b) a restraint means for restraining a portion of a patient to said seat;

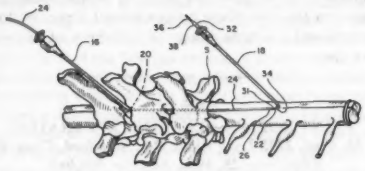
(c) motion module means for measuring the position and changes in position of an unrestrained part of a restrained patient in relation to the restrained part of said patient;

(d) processor means for analyzing outputs of said dynamometer means and said motion module means and for providing indications of forces applied to said dynamometer and position as measured by said motion module means, whereby forces applied to the unrestrained portion of a patient can be analyzed as a function of its position and the resulting forces applied to the seat via the patient.

4,549,556
IMPLANTABLE LEAD

Peter P. Tarjan, Miami; Sandra L. Miller, No. Miami, and John Martin, Miami, all of Fla., assignors to Cordis Corporation, Miami, Fla.

Filed Dec. 8, 1982, Ser. No. 448,007
Int. Cl.[4] A61N 1/04
U.S. Cl. 128—785 16 Claims



1. An elongate flexible, electrically conductive neural stimulator lead including an electrical conductor for implantation in the spinal column of a patient and having leading and trailing ends, a non-conductive coating covering said conductor, and an electrode electrically connected to the conductor at one end thereof with at least a portion of said electrode being in electrical communication with the exterior of said coating to define an electrical contact region, wherein the improvement in said lead comprises:

said leading and trailing ends each being of substantially uniform diameter;

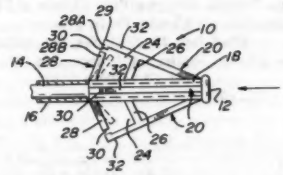
said contact region being located substantially intermediate said leading and trailing ends of said lead such that each of said leading and trailing ends is sufficiently long as to percutaneously exit the body at spaced locations therein when said contact region is positioned within the spinal column of a patient during implantation; and

means adjacent said contact region for stabilizing said lead within the spinal column with the contact region within the spinal column and the leading and trailing ends percutaneously exiting the body.

4,549,557
PACEMAKER ELECTRODE

A-Hadi I. Hakki, 1536 Woodland Ave., Folcroft, Pa. 19032

Filed Nov. 1, 1983, Ser. No. 547,605
Int. Cl.[4] A61N 1/04
U.S. Cl. 128—785 6 Claims

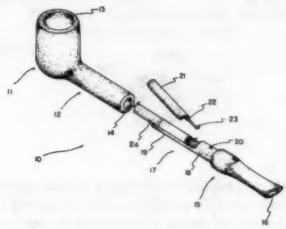


1. In an electrode for insertion into the human heart, the electrode having an electrically conductive contact at an end thereof, a flexible electric conductor connected to the contact a flexible insulating sheath rearward of the contact and encasing the conductor, and at least one flexible barb, each barb comprising an arm connected to said flexible insulating sheath adjacent said contact defining an opening therebetween, the improvment comprising a bifurcated rib comprising a first rib element connected to the arm and a second rib element connected to the sheath, said rib elements being separated by a gap communicating with said opening.

4,549,558
SMOKING APPLIANCE

Samuel T. Gregory, Rich Square Rd., Scotland Neck, N.C. 27874

Filed Aug. 6, 1984, Ser. No. 637,963
Int. Cl.[4] A24D 1/04
U.S. Cl. 131—202 9 Claims

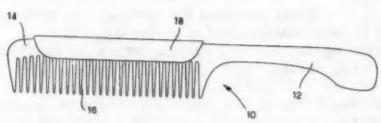


1. An improved smoking appliance comprising: an elongated stem means having a longitudinal opening therein operatively communicating with a smoking material holding means; an elongated mouthpiece means having a longitudinal opening therein passing therethrough; a generally semi-cylindrical filter support means secured to and outwardly extending from one end of said mouthpiece means; and a generally semi-cylindrical closure means mounted adjacent said semi-cylindrical filter support means to form a generally cylindrical configuration therebetween whereby when a filter means is placed in said semi-cylindrical support means and said semi-cylindrical closure means is placed thereover, the thus formed cylindrical configuration can be placed in said longitudinal opening in said stem to form an improved smoking appliance.

4,549,559
COMBINING DEVICE WITH ANTISTATIC PROPERTIES

Jean-Louis H. Gueret, Paris, and Jean-Paul C. Beck, Villepinte, both of France, assignors to L'Oreal, Paris, France

Filed Mar. 21, 1983, Ser. No. 477,518
Claims priority, application France, Apr. 22, 1982, 82 06901
Int. Cl.[4] A45D 24/00
U.S. Cl. 132—11 R 20 Claims



1. In a combing device, formed by moulding of a composition containing at least one plastic material and a carbon constituent, the improvement wherein it comprises:

(a) a body formed of a compound which contains (aa) at least one plastic material (ab) at least one plasticizer for said at least one plastic material in a quantity of from 25% to 100% by weight in relation to the total weight of the said at least one plastic before addition of the plasticizer, and (ac) from 3 to 20% by weight of said carbon constituent expressed in relation to the total formed by the at least one plastic material and said at least one plasticizer and,

(b) mechanical stiffening means associated with said body.

4,549,560

HAIR CURLING APPLIANCE WITH ELASTOMER MATERIAL COVERING HEATING ELEMENT

Matthew L. Andis, Racine, Wis., assignor to Andis Company, Racine, Wis.

Filed Mar. 19, 1984, Ser. No. 591,130
Int. Cl.[4] A45D *2/24*
U.S. Cl. 132—37 R 18 Claims

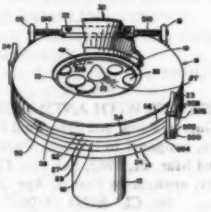
1. A hair curling appliance including a handle, and a heating element including a metal cylinder fixedly extending from said handle and including an outer surface, and an outer covering which is made of elastomer material and which substantially covers said outer surface of said metal cylinder.

4,549,561

COIN HANDLING MACHINE

Roy B. Johnson, deceased, late of Manchester, Tenn. (by Wilma J. Johnson, legal representative), and Victor G. Ristvedt, Manchester, Tenn., assignors to Ristvedt-Johnson, Inc., Mt. Prospect, Ill.

Division of Ser. No. 503,530, Jun. 13, 1983, Pat. No. 4,531,531, which is a continuation-in-part of Ser. No. 207,963, Nov. 18, 1980, Pat. No. 4,444,212, which is a continuation-in-part of Ser. No. 921,063, Jun. 30, 1978, Pat. No. 4,234,003, which is a continuation of Ser. No. 735,060, Oct. 22, 1976, Pat. No. 4,098,280. This application Dec. 31, 1984, Ser. No. 688,020
The portion of the term of this patent subsequent to Jul. 4, 1995, has been disclaimed.
Int. Cl.[4] G07D *3/00*
U.S. Cl. 133—3 A 11 Claims



1. A coin sorter apparatus for receiving and sorting mixed coins by denomination, said apparatus comprising:

a rotating disc having a resilient surface for receiving said mixed denomination coins and imparting a rotational movement to said mixed denomination coins,

a stationary disc having ridges and recesses on its underside and being proximate to said resilient surface of said rotating disc,

a first area of ridges and recesses on the underside of said stationary disc for receiving the rotating mixed denomination coins into the region between the two discs,

a second area of ridges and recesses on the underside of said stationary disc for removing coins stacked or shingled on another coin,

a third area of ridges and recesses on the underside of said stationary disc for receiving coins from said second area and said recesses in said third area having regions for releasing coins from a pressed engagement with said resilient surface and thereby permitting radial movement of coins within said regions by centrifugal force, and said regions being shaped to guide coins in a single file along a predetermined path to predetermined radial positions on the rotating disc, and

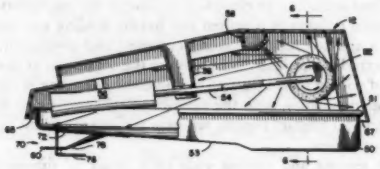
a fourth area of ridges and recesses on the underside of said stationary disc for receiving coins from said third area and effecting a pressed engagement with said rotating disc and with said recesses of said fourth area releasing coins in said fourth area from pressed engagement and being shaped to permit coins of different sizes to escape radially from between the two discs, by centrifugal force, at different preselected positions along the periphery of said stationary disc.

4,549,562

PAINT ROLLER CLEANING APPARATUS

James M. Ossi, 2295 Long Ridge Rd., Stamford, Conn. 06903

Filed Nov. 25, 1983, Ser. No. 554,948
Int. Cl.[4] B08B *3/02;* B44D *3/12;* E06C *7/14*
U.S. Cl. 134—138 16 Claims



1. Paint roller cleaning apparatus comprising:

a unitary paint tray lid having a top wall of a size for substantially covering a paint tray and with a pair of side walls and at least one end wall extending therefrom;

a plurality of clips inside said lid adapted to hold a handle-equipped frame-supported paint roller in spaced relation to the interior surface of said top wall;

a water spray manifold mounted inside said lid and extending substantially across the width thereof, said manifold containing a plurality of spaced orifices across its length aimed to direct water evenly across a paint roller held within said lid; and

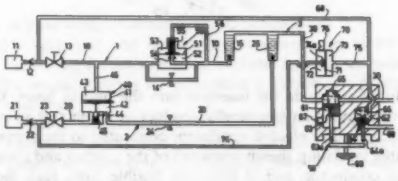
a hose having one end thereof coupled to said manifold to supply water to said manifold under pressure.

4,549,563

GAS MIXERS

Jean-Pierre Monnier, Maurepas, France, assignor to L'Air Liquide, Societe Anonyme Pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Jun. 23, 1983, Ser. No. 507,066
Claims priority, application France, Jun. 29, 1982, 82 11343
Int. Cl.[4] G05D *11/03*
U.S. Cl. 137—100 6 Claims



1. A mixer for delivering a mixture of a gas and a second gas in proportions of X/100 and (100−X)/100 respectively, comprising first and second circuits respectively connected to sources of said first and second gases, and delivering said first and second gases to flow-meter means, said first and second

circuits respectively including first and second flow-rate control valves for independently controlling the flow rates of said first and second gases, and first and second calibrated orifices so calibrated that for an identical pressure of both cases, the rates of flow of said first and second gases through the first and second orifices are in the ratio of X/(100−X), pressure limiting means connected between said first and second circuits, for limiting the pressure of the second gas to that of the first gas, and means connected in parallel with said first calibrated orifice for limiting to a constant value the pressure in the first circuit and consequently the pressure in the second circuit if the rate of flow of the first gas exceeds a predetermined value, the last-named means comprising a first chamber continuously communicating with said first circuit upstream from said first orifice and a diaphragm exposed to the action of a calibrated spring to open an outlet from said first chamber which is connected to said first circuit downstream from said first orifice only when the rate of flow of the first gas exceeds said predetermined value, and a second chamber in which said calibrated spring is housed, said second chamber being connected via a conduit to said first circuit downstream of said first chamber.

4,549,564

PRESSURE MODULATOR VALVE

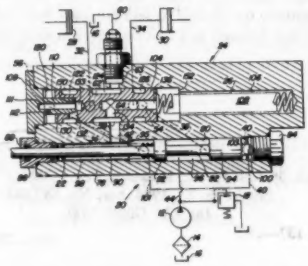
Sabah Halabiya, Rheinhausen, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

Filed Oct. 22, 1984, Ser. No. 663,611

Claims priority, application European Pat. Off., Oct. 26, 1983, 83110666.1

Int. Cl.⁴ F15B *11/16*

U.S. Cl. 137—110 **9 Claims**



1. A pressure modulating valve comprising: a housing; a bore provided in said housing and having closed ends; an elongated circular projection extending axially into said bore from one closed end thereof and having a diameter less than the diameter of said bore; a valve slide axially slidable in said bore between first and third extreme positions while passing through a second position, said slide and the one closed end of the bore forming a variable volume fluid chamber; a blind bore provided in the end of said slide facing said projection, said blind bore having a diameter to slidably receive said projection; spring means in said bore acting between the second closed end thereof and the end of the slide to yeildably urge the slide to its first position in which the blind bore is fully positioned over said projection; a first passage opening into said bore adjacent the one end thereof and into the fluid chamber whereby when fluid pressure is directed through said first passage to said fluid chamber the pressure acting on the blind bore end of the slide will urge the slide against the force of the spring toward the third position which is displaced from the first position; a first annular slot provided in the outer surface of said slide; a consuming unit opening communicating with said housing bore in a position to be in communication with said slot when the slide is in at least two of its positions; a fluid passage formed in the slide providing communication between the blind bore and the first groove; and a restricted fluid passage in the projection providing restricted communiction between the fluid chamber and fluid passage in the slide in at least one of said at least two positions of the slide.

4,549,565

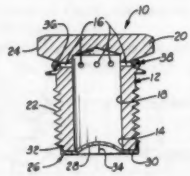
RECLOSING RUPTURE DISK ASSEMBLY

Edward H. Short, III, Tulsa, Okla., assignor to BS&B Safety Systems, Inc., Tulsa, Okla.

Filed Mar. 5, 1984, Ser. No. 586,279

Int. Cl.⁴ F16K *13/04*

U.S. Cl. 137—71 **4 Claims**



1. A rupture disk assembly which recloses itself to prevent backflow after rupture and pressurized fluid relief therethrough, comprising:

a hollow substantially cylindrical rupture disk support member having a pressurized fluid inlet opening at one end, a closed opposite end and at least one pressurized fluid discharge port extending through a side thereof adjacent said closed end, said support member including threads disposed around the outside periphery of a portion of the end having said pressurized fluid inlet opening therein and a plurality of flat surfaces formed around the outside periphery of a portion of the closed opposite end thereof for facilitating threadedly connecting the support member into a complementary threaded fitting;

a rupture disk sealingly attached to said support member over the end thereof having said pressurized fluid inlet opening therein whereby until rupture of said rupture disk, pressurized fluid is prevented from flowing from said fluid inlet opening of said support member to said discharge port thereof; and

a resilient closure member ring positioned on and around the external sides of said support member with a portion thereof sealingly positioned over said pressurized fluid discharge port thereof, said resilient closure member ring being of a size such that its resiliency biases it towards the sides and the pressurized fluid discharge port of said support member so that upon rupture of said rupture disk and the release of pressurized fluid through said support member to said discharge port, the force of the pressurized fluid exerted on said closure member overcomes the bias of and moves said closure member away from said discharge port whereby said pressurized fluid flows therethrough, but upon termination of the flow of pressurized fluid through said discharge port said closure member moves back into a sealing position over said discharge port.

4,549,566

FLOW VOLUME CONTROL DEVICE FOR POWER STEERING SYSTEM

Hidetoshi Fujiwara, and Akihiko Sato, both of Okazaki, Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Oct. 15, 1984, Ser. No. 661,088

Claims priority, application Japan, Oct. 18, 1983, 58-194982

Int. Cl.⁴ G05D *11/00*; F04B *49/08*

U.S. Cl. 137—117 **4 Claims**

1. A flow volume control device for use in a power steering system, comprising:

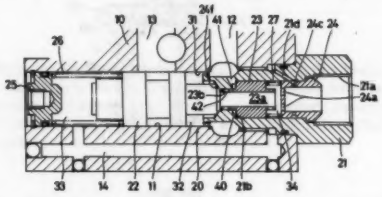
a casing having an inlet port, a reflux port and a delivery port;

a fluid passage formed in said casing in communication with said inlet, reflux and delivery ports;

a fixed orifice means provided in said fluid passage to restrict the flow of pressurized fluid from said inlet port to said reflux and delivery ports;

a throttle means provided in said fluid passage between said fixed orifice means and delivery port;

a main spool movable in response to pressure differential across said throttle means for controlling the flow rate of said pressurized fluid from said fixed orifice means to said



reflux port to maintain a predetermined flow rate of the fluid to be fed to said delivery port through said throttle means;

an auxiliary spool movable in response to the pressure differential across said fixed orifice means for reducing the open area of said throttle means according to increases of fluid pressure supplied to said inlet port; and

a branch passage formed in said casing bypassing said fixed orifice means to connect said inlet port directly to said throttle means, said branch passage being opened when said auxiliary spool is shifted to reduce the open area of said throttle means thereby to slow down the speed of movement of said auxiliary spool.

4,549,567

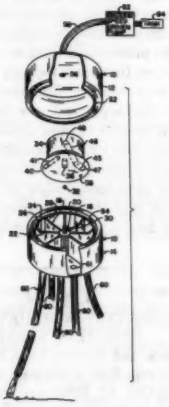
FLUID DISTRIBUTOR

Donelson B. Horton, Rte. 1, Box 119, Madison, Ala. 35758

Filed Sep. 26, 1983, Ser. No. 535,642

Int. Cl.[4] E03B *11/00*

U.S. Cl. 137—262 9 Claims



1. A fluid distributor comprising:

a fluid housing comprising:

a tubular inner side wall region,

a top wall enclosing the top of said fluid housing and having an inlet opening concentric with said tubular side wall region, and

a bottom wall having a plurality of circumferentially spaced exit openings, said openings being in the radially measured outer peripheral region of said bottom;

a plurality of walls extending radially outward from the center of said housing to said side wall and forming with said tubular side wall a plurality of discrete compartments in a lower region of said housing, each said compartment being formed over one of said openings;

rotary coupling means for coupling fluid from said inlet opening sequentially into said compartments including a rotor rotatably supported by said housing above said compartments, said rotor generally closing over said compartments and including a passageway having an entrance positioned adjacent to and adapted to receive fluid from said inlet opening and having a lower exit opening radially positioned between a tubular center of said housing and said tubular side wall above an outer region of said compartments, and said passageway having an exit end region extending along a line which has a directional component downward and a directional component tangential with a circle through which said exit opening would traverse by the rotational of said rotor and by which flow is directed in an off-normal path with respect to said side wall region; and

wherein said exit openings have a cross section of no less than 400% of the cross section of said inlet opening;

whereby, upon there being supplied a fluid material through said inlet opening, the fluid would pass through said passageway, and upon exiting, would create a reaction which would rotate said rotor, and thereby fluid would be sequentially distributed to said compartments and exit unrestricted through said exit openings in said fluid housing.

4,549,568

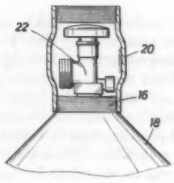
VALVE ENCLOSURE

Mel Trail, 36 Still Forest, Houston, Tex. 77024

Filed Feb. 23, 1984, Ser. No. 582,941

Int. Cl.[4] G09F *3/00*

U.S. Cl. 137—382 9 Claims



1. A valve enclosure for enclosing a valve on a gas container, comprising:

(a) a substantially cylindrical body open at each end, said body including first and second ends having substantially identical interior threads formed thereon for connecting said body to the gas container and orienting said body relative to the gas container to indicate whether the gas container is full or empty;

(b) opening means located in said body adjacent said first and second ends for draining fluid accumulating about the valve; and

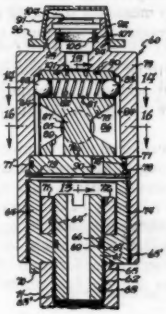
(c) indicator means on the exterior of said body about said first and second ends for visually determining whether the gas container is full or empty.

4,549,569

LOCKING VALVE CONSTRUCTION

John H. Taylor, Orchard Park, N.Y., assignor to McGard, Inc., Buffalo, N.Y.

Division of Ser. No. 370,355, Apr. 21, 1982, Pat. No. 4,495,910.
This application Oct. 1, 1984, Ser. No. 656,486
Int. Cl.[4] F16K *27/08*
U.S. Cl. 137—382.5 19 Claims



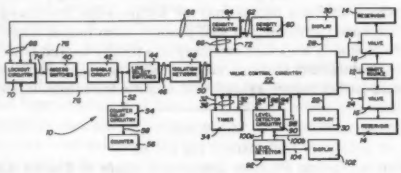
1. A locking valve construction comprising a housing, a valve member in said housing, a fluid inlet and a fluid outlet in said housing, key means for moving said valve member to an open position for selectively effecting communication between said fluid inlet and said fluid outlet, holding means on said housing for holding said housing against movement when said valve member is being moved relative to said housing by said key means, and means for permitting said housing and said valve member to move as a unit in the event said holding means is rendered inoperative to thereby prevent said valve member from moving relative to said housing to its open position.

4,549,570

WASTE DISPOSAL MONITORING SYSTEM

Kenneth D. Cook, 3701 Godfrey, Midland, Tex. 79701, and Timothy R. Proctor, 1117 Overton, Odessa, Tex. 79763

Filed Oct. 12, 1982, Ser. No. 433,841
Int. Cl.[4] G05B *13/00*; G05D *7/00*
U.S. Cl. 137—389 3 Claims



1. A monitoring system for a fluid waste disposal system wherein fluid is transported from a source to a waste disposal reservoir comprising:

valve means disposed between the source and the waste disposal reservoir for controlling fluid flow;

switch means for selectively actuating said valve means for permitting fluid to flow from the source to the waste disposal reservoir;

sensor means for sensing the density of the fluid and for generating an output signal when the density of the fluid increases above a predetermined level;

first counter means responsive to said sensor means output signal for generating an alarm signal if said first counter means reaches a predetermined maximum count before being reset;

second counter means interconnected to said first counter means for resetting said first counter means if said alarm signal is not generated within a predetermined time to thereby prevent generation of said alarm signal for the intermittent presence of fluid having a density above said predetermined level; and

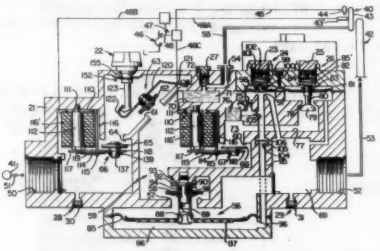
said valve means responsive to said alarm signal for preventing the continued flow of fluid from the source to the waste disposal reservoir.

4,549,571

FUEL CONTROL VALVE CONSTRUCTION, PARTS THEREFOR AND METHODS OF MAKING THE SAME

Samuel T. Kelly, Torrance, Calif., assignor to RobertShaw Controls Company, Richmond, Va.

Filed May 24, 1984, Ser. No. 613,462
Int. Cl.[4] F16K *31/385*
U.S. Cl. 137—489.5 10 Claims



1. In a fuel control valve construction having a housing means provided with an inlet means adapted to be interconnected to a fuel source and an outlet means adapted to be interconnected to a burner means, said housing means having a main pressure regulator means and a main valve means operated by said main pressure regulator means for controlling fuel flow from said inlet means to said outlet means to provide a full rated flow of fuel to said burner means, said housing means having a bypass means for interconnecting said inlet means to said outlet means to provide a fuel flow to said burner means that is less than a full rated flow of fuel but is sufficient by itself to support combustion at said burner means until said main valve means provides said full rated flow of fuel thereto, said main valve means comprising a main valve seat in said housing means between said inlet means and said outlet means and a main valve member for opening and closing said main valve seat under the control of said main pressure regulator means, said main valve means comprising a main flexible diaphragm means carried by said housing means and defining a chamber therewith on one side of said main diaphragm means and being operatively interconnected to said main valve member on the other side of said main diaphragm means to control the position of said main valve member relative to said main valve seat in relation to the position of said main diaphragm means as determined by the value of the fluid pressure maintained in said chamber by said main pressure regulator means, the improvement wherein said housing means has a bypass pressure regulator means for controlling the flow of fuel through said bypass means independently of the operation of said main pressure regulator means, said housing means having a passage means leading from said inlet means to said main valve seat, said passage means having one branch intermediate said inlet means and said main valve seat leading to said outlet means and being provided with a restriction means therein, said passage means having another branch intermediate said inlet means and said main valve seat leading to said bypass means, said housing means having a valve unit for opening and closing said branches intermediate said inlet means and said restriction means for said one branch and intermediate said inlet means and said bypass pressure regulator means for said other branch, said housing means having a passage interconnected to said chamber and having a

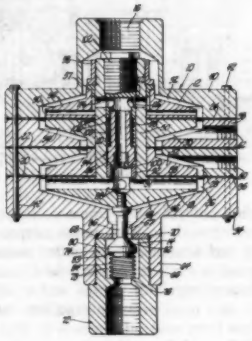
bleed point thereof interconnected to said one branch intermediate said restriction means thereof and said outlet means, said housing means having another restriction means in parallel to the first mentioned restriction means and interconnecting said one branch intermediate said valve unit and the first mentioned restriction means to said passage so as to pressurize said chamber with fuel pressure when said valve unit is in an open condition thereof, said main pressure regulator means being responsive to pressure in said outlet and being located adjacent said bleed point for controlling the pressure value of said fuel pressure in said chamber by controlling the amount of bleed between said passage and said one branch at said bleed point.

4,549,572

PRESSURE COMPENSATED FLUID FLOW REGULATOR

Dolph D. Wright, Union Lake, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 24, 1984, Ser. No. 653,556
Int. Cl.⁴ G05D *7/03*
U.S. Cl. 137—495 **7 Claims**



1. A fluid flow regulator responsive to pilot pressure comprising:

a housing having a central cavity and inlet and outlet ports;

a spool in the central cavity defining a space between the spool and the housing, the spool having a flow passage extending between a region of regulated pressure and a region of outlet pressure;

a poppet for seating in the inlet port for controllably admitting fluid through the inlet port;

means mounting the poppet on the spool for movement therewith;

means for establishing a regulated pressure at one end of the flow passage by controlling the poppet position including a plurality of diaphragms between the spool and the housing, means for applying pilot pressure and outlet pressure to respective diaphragms to urge the poppet away from its seat, and means for applying regulated pressure to a diaphragm to urge the poppet toward its seat so that the regulated pressure is a function of the pilot pressure and the outlet pressure; and

a sharp-edged orifice in the flow passage of the spool for regulating the fluid flow rate from the inlet port to the outlet port according to a function of the difference between the regulated pressure and the outlet pressure.

4,549,573

SPRAY VALVE ASSEMBLY

Gerald H. Breckenridge, Rte. 1, Box 169, McCrory, Ark. 72101

Filed Mar. 9, 1984, Ser. No. 587,818
Int. Cl.⁴ F16K *17/04*
U.S. Cl. 137—495 **4 Claims**

1. A spray valve assembly adapted to be coupled to an aircraft spray boom, spray manifold or other pressurized source of agri-chemical fluids to be sprayed, the spray valve assembly comprising:

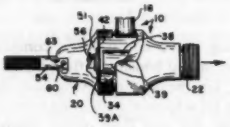
rigid, generally tubular valve body means comprising an output end adapted to be coupled to a conventional spray fitting, spray nozzle or the like, said body means also comprising an inner volume and a spaced apart threaded coupling end, said valve body being of a preselected length and having a longitudinal axis;

input passageway means for admitting said agrichemicals to be sprayed interiorly of said inner volume of said body means;

generally tubular fluid admittance means in fluid flow communication with said valve body output end and coaxially secured relative to said axis, said admittance means having an input;

valve head means adapted to be secured to said spaced apart threaded coupling of said valve body in axial alignment with said admittance means, said head means sealably confining fluid interiorly of said spray valve assembly;

plunger means normally biased toward said admittance means input, said plunger means comprising ram means and elongated stem means for controlling said ram means, said stem means and said ram means controlled thereby



being axially moveable with respect to said valve head means;

internal gasket means for selectively blocking and unblocking said admittance means input in response to said plunger ram means whereby to control passage of agrichemical fluid through said admittance means;

pin means penetrating said plunger stem means for selectively disposing said assembly in a desired functional position; and,

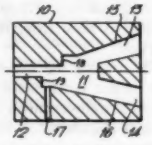
said valve head means including follower slot means for trackably receiving said pin means, said follower slot means including a first portion generally parallel with said axis and permitting axial displacements of said plunger means whereby to facilitate active operation of said assembly, and an inner, generally transverse locking portion in which said pin means may be temporarily positioned in response to twisting of said plunger stem means whereby to yieldably lock said assembly in a totally locked position by maintaining said ram means in sealing engagement with said gasket means against said admittance means input.

4,549,574

FLUIDIC DEVICES

Stephen A. Taylor, Preston, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed May 7, 1984, Ser. No. 607,821
Claims priority, application United Kingdom, May 20, 1983, 8314054
Int. Cl.⁴ F15C *1/10*
U.S. Cl. 137—565 **4 Claims**



1. A fluidic diverter comprising a housing, a chamber within the housing, a fluid inlet at one end of the chamber, diverging fluid outlets at the opposite end of the chamber, the walls of the

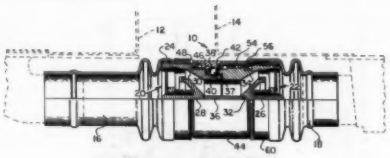
chamber merging smoothly with the walls of the outlet, a first step in one wall of the chamber at its junction with the inlet, a second substantially identical and oppositely directed step in the opposing wall of the chamber at a position staggered axially with respect to the first step to provide an asymmetric configuration at the inlet end of the chamber and a control port communicating with the chamber at a position associated with the first step.

4,549,575

BREAKAWAY FLUID SYSTEM

Russell L. Rogers, Munith, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

Filed Jun. 27, 1984, Ser. No. 624,957
Int. Cl.[4] F16L *37/28*
U.S. Cl. 137—614.03 **4 Claims**



1. A self-sealing breakaway fluid coupling for a flexible hose conduit system characterized by its economy of manufacture and dependable operation comprising, in combination, first and second annular body parts each having an axis, a flow passage, a conduit attachment end, and a connecting end, conduit attachment means defined adjacent said first part conduit attachment end comprising an annular cylindrical recess defined in said first body part, a first hose conduit having an end received upon said recess, a first compression band encompassing said first hose conduit end in radial alignment with said recess compressing said first hose conduit end into said recess in a sealed relationship, a spring biased self-closing valve within each body part flow passage operatively engagable with each other upon the parts being interconnected to hold the valves open, releasable locking means interposed between said body parts at said connecting ends selectively locking said parts in interconnected relationship, said locking means comprising an axially displaceable annular operating member mounted on said second body part movable between a locking position and a release position, spring means biasing said operating member toward said locking position, an annular cylindrical recess defined upon said operating member, a second hose conduit having an end received upon said member recess, a second compression band encompassing said second hose conduit end in radial alignment with said member recess compressing said second hose conduit end into said member recess in a sealed relationship, and sealing means sealing said operating member to said first and second body parts when said operating member is in said locking position to seal said first and second body parts relative to each other when said parts are interconnected and said valves are open.

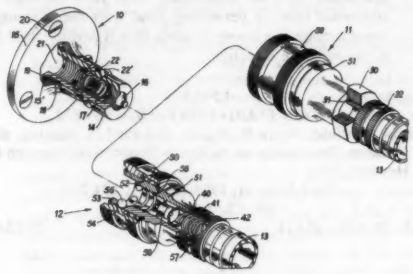
4,549,576

QUICK DISCONNECT MARINE COUPLING SYSTEM

Bruce A. Angel, Stokesdale, N.C., assignor to AMF Incorporated, White Plains, N.Y.

Filed Sep. 11, 1981, Ser. No. 301,253
Int. Cl.[4] F16L *37/28*
U.S. Cl. 137—614.04 **7 Claims**

1. A marine coupler comprising a pipe flange having a first surface for mounting to a second surface substantially parallel thereto, said flange having a central opening and a separable tubular coupler housing extending out therefrom, the inner end of said tubular housing being mounted in said opening by a



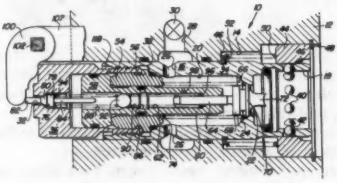
threaded connection therebetween, and a valve included within the outer end of the coupler housing.

4,549,577

FEMALE COUPLER FOR A FLUID CIRCUIT

Uwe H. Kugler, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Feb. 11, 1985, Ser. No. 699,755
Int. Cl.[4] F16L *37/00*
U.S. Cl. 137—614.04 **5 Claims**



1. A female coupler for engagement with a male coupler having a check valve, said female coupler comprising:

(a) a housing having a bore open at at least one end and a passage communicating with the bore at a location spaced from the open end;

(b) a receptacle slidably positioned within the housing bore and having an engagement bore open to the open end of the housing bore for receiving a male coupler, a main bore spaced from the engagement bore, a passageway joining the engagement and main bores, an inlet port providing communication between the main bore and housing passage, and an outlet providing communication between the main bore and housing bore;

(c) a piston having a rod extending from one side thereof slidably positioned within said main bore and dividing said main bore into a first chamber into which the rod extends and with which the inlet port and passageway communicates and a second chamber with which the outlet port communicates, said piston and rod having an additional bore extending therethrough from one chamber to the other;

(d) a first poppet valve having a guidance portion slidable in said additional bore, a head portion in the first chamber for movement between positions opening and closing the passageway, and a projection extending from the head portion through the passageway;

(e) a stop within the main bore between the piston and passageway;

(f) a spring acting between the stop and first poppet valve urging the first poppet to a position closing the passageway;

(g) a second poppet valve movable between open and closed

positions for controlling flow through the outlet port; and

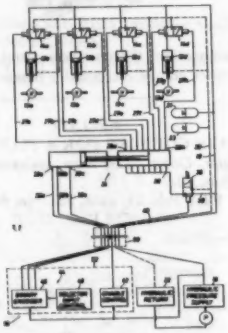
(h) a flow check prevention valve positioned within said additional bore for controlling fluid flow through said additional bore by permitting fluid flow therethrough in one direction at a lower pressure than it permits fluid flow in the opposite direction.

4,549,578

CODED FLUID CONTROL SYSTEM

David A. Hibbs; Wynn P. Rickey, and Paul N. Stanton, all of Houston, Tex., assignors to Exxon Production Research Co., Houston, Tex.

Filed Mar. 21, 1984, Ser. No. 591,733
Int. Cl.[4] F15B *18/00*
U.S. Cl. 137—624.11 **29 Claims**



1. A valve for routing fluid from at least one fluid supply conduit to a selected one of a plurality of fluid receiving conduits, said valve comprising:

an input pressure port adapted to be placed in fluid communication with said fluid supply conduit;

a plurality of outlet pressure ports, each being adapted to be placed in fluid communication with a corresponding one of said fluid receiving conduits;

a fluid passageway element moveable through a number of positions relative to said outlet pressure ports, in at least some of said positions said fluid passageway element establishing fluid communication from said input pressure port to at least one of said outlet pressure ports;

an actuator having a plurality of code input ports and an output member moveable to a number of distinct positions, each of said code input ports being adapted to receive a pressure signal, there being two possible pressure signals associated with each code input port, a relatively high pressure signal and a relatively low pressure signal, the signal existing at a given time at each code input port defining one bit of a multi-bit select code, the actuator being adapted to adjust the output member to a position corresponding to the applied select code; and,

means for interfacing the actuator output member and the fluid passageway element such that the application of a select code to the code input ports causes the routing valve to establish fluid communication from the inlet pressure port to an outlet port corresponding to said applied select code.

4,549,579

STRAIGHT-WAY VALVE

Konrad Bergmann, Wittlich, Fed. Rep. of Germany, assignor to American Standard Inc., New York, N.Y.

Filed Jun. 22, 1984, Ser. No. 623,643
Int. Cl.[4] F16K *11/02, 3/08*
U.S. Cl. 137—625.21 **4 Claims**

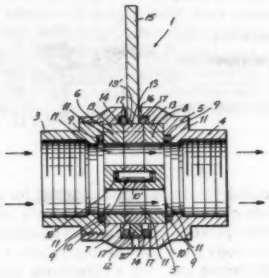
1. A straight-way valve assembly comprising:

a valve body having a longitudinal passageway extending therethrough and a circumferential slot formed between the ends thereof, each end of said passageway having inlet and outlet openings to couple, respectively, to fluid supply and delivery lines;

said valve body having an annular recess formed between the ends of said passageway and being aligned with said circumferential slot;

regulating elements, operably mounted in said valve body, include a plurality of discs, one of which is mounted for rotation, at least one of said other discs statically mounted in said valve body and arranged in face-to-face contact against said rotatable disc, actuating means disposed in said slot and coupled to said rotatable disc and a pair of spaced apart resilient bearing rings positioned around opposed faces of said actuating means and disposed in said annular recess;

an axle mounted through an axial bore formed in said rotatable disc, at least one end of which is disposed in a corresponding recess of said at least one static disc for rotation therein;



said rotatable disc having a plurality of flow ports which correspond with flow ports formed in said at least one static disc, said rotatable disc having at least one recess formed in the surface facing away from said fluid supply line, said at least one recess extending between said flow ports to provide disc vent means; and

said disc vent means communicating with said annular recess and said circumferential slot so that said at least one recess of said rotatable disc is in fluid communication with said annular recess and circumferential slot to provide a pathway to vent fluid from entering the delivery lines when said straight-way valve is in its closed position.

4,549,580

PLUG ASSEMBLY FOR OFFSHORE PLATFORMS

Tommie A. Freeman, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Oct. 22, 1984, Ser. No. 663,271
Int. Cl.[4] E02D *7/00*; E02B *17/08*
U.S. Cl. 138—89 **20 Claims**

1. A removable plug assembly for temporarily sealing the interior of an annular member to prevent the flow of fluid therethrough, said annular member having an upper plug assembly retaining ring and lower plug assembly retaining ring installed therein, said removable plug assembly comprising:

a packer mandrel assembly including:

a packer mandrel body having a first and second plurality of apertures therein;

a dished head secured to the interior of the packer mandrel body having a collet sleeve retained therein, the collet sleeve having an annular recess therein and a collet member secured to one end thereof;

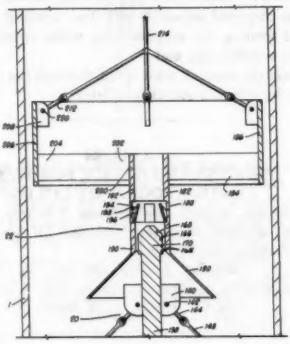
a plurality of upper locking dogs pivotally mounted on the packer mandrel body for retaining said removable plug assembly from axial movement in one direction when said removable plug assembly is installed in said annular member having the plurality of upper locking dogs engaging said upper plug assembly retaining ring; and

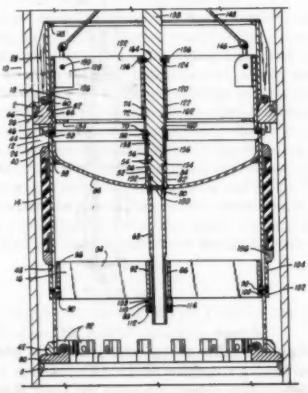
a plurality of lower locking dogs pivotally mounted on the packer mandrel body for retaining said removable plug assembly from axial movement in another direction when said removable plug assembly is installed in said annular member having the plurality of lower locking dogs engaging said lower plug assembly retaining ring;

a packer member located on the packer mandrel body of the packer mandrel assembly engaging a portion thereof for sealingly engaging the interior of said annular member;

packer setting assembly including:

a packer setting mandrel having a collet member secured to one end thereof, a portion of the collet member adapted to engage the annular recess in the collet sleeve retained in the dished head of the packer mandrel assembly, and having a ratchet threaded portion on the exterior thereof;





a packer setting sleeve assembly slidably disposed about the other end of the packer setting mandrel; and

a packer setting ratchet nut adapted to engage the ratchet threaded portion of the exterior of the packer setting mandrel and to abuttingly engage a portion of the packer setting sleeve assembly;

a dog locking sleeve assembly slidable within the packer mandrel body of the packer mandrel assembly adapted to engage the plurality of upper locking dogs when said removable plug assembly is installed in said annular member, the dog locking sleeve assembly including:

a cylindrical annular dog locking sleeve having an annular recess therein adapted to releasably receive a portion of the collet member secured to the collet sleeve retained within the dished head of the packer mandrel body of the packer mandrel assembly and a plurality of apertures therein;

a dog locking sleeve body adapted to engage the plurality of upper locking dogs of the packer mandrel assembly;

a plurality of radial supports, each support having one end thereof secured to the cylindrical annular dog locking sleeve and the other end thereof secured to the dog locking sleeve body;

a plurality of lifting lugs secured to the dog locking sleeve body, each lifting lug having an aperture therein;

a plurality of shearable threaded fasteners adapted to be received by and extend through the plurality of apertures in the cylindrical annular dog locking sleeve; and

a pressure equalization plug assembly releasably secured within said removable plug assembly for controlling the release of the collet member secured to one end of the packer setting mandrel of the packer setting assembly from the collet sleeve retained within the dished head secured to the interior of the packer mandrel body of the packer mandrel assembly and the release of the collet member secured to one end of the collet sleeve retained within the dished head secured to the interior of the packer mandrel body of the packer mandrel assembly from the cylindrical annular dog locking sleeve of the dog locking sleeve assembly and for allowing the flow of fluid through and around said removable plug assembly when said removable plug assembly is installed in said annular member.

4,549,581

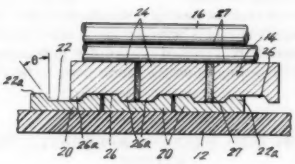
FLEXIBLE PIPE

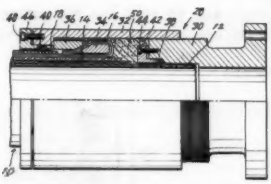
Yohei Unno, Yokohama; Satoru Ueno, Chiba; Kazuo Sadamitsu, Yamato, and Tsuneo Okamoto, Hiratsuka, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Mar. 19, 1984, Ser. No. 591,004

Int. Cl.[4] F16L *11/16*

U.S. Cl. 138—109 **13 Claims**





1. A flexible pipe comprising at least one internal plastic sheath, a spiraled short pitched metal armor layer provided on said internal plastic sheath, a long pitched metal armor layer provided on said short pitched metal armor layer, and an external plastic sheath provided on said long pitched metal armor layer, said short pitched metal armor layer including a first inner layer portion of spirally wound metal strip having inwardly and outwardly facing surfaces and having a recess provided in the outwardly facing surface thereof and a separate second outer layer portion of spirally wound metal strip having a recess provided in the inwardly facing surface thereof so that legs formed by said recess of said second layer portion are engaged across legs formed by the recess of each of adjacent turns of said first layer portion, and said legs of said metal strips for said first and second layer portions having said facing surfaces outwardly inclined toward the opening of the respective recess.

4,549,582

APPARATUS FOR REMOVING SEVERED FABRIC PARTS FROM A WEAVING MACHINE

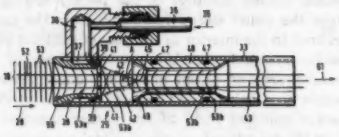
Walter Küng, Tann-Dürnten, and Stefan Svarc, Rüti, both of Switzerland, assignors to Maschinenfabrik Sulzer-Rüti AG, Rüti, Switzerland

Filed May 21, 1984, Ser. No. 612,337

Claims priority, application European Pat. Off., Jun. 6, 1983, 83810236.6

Int. Cl.⁴ D03D *47/40*

U.S. Cl. 139—430 **6 Claims**



1. An apparatus for removing fabric parts such as selvedges, protruding warp thread ends and the like severed at the edge of a fabric produced on a weaving machine, comprising:

an injector nozzle arranged at the region of an edge of the fabric being woven;

said injector nozzle generating a substantially conically convergent air jet;

said air jet surrounding the fabric part to be removed;

a removal conduit provided for said injector nozzle;

said removal conduit surrounding the fabric parts to be removed;

said removal conduit comprising a plurality of individual air supply passages;

said air supply passages being directed away from a shed of the weaving machine;

said removal conduit having a longitudinal axis; and

said air supply passages being arranged skew to said longitudinal axis of the removal conduit for generating a rotary air current acting upon the fabric parts to be removed.

4,549,583

ARMATURE COIL WINDING APPARATUS FOR FLAT MOTOR

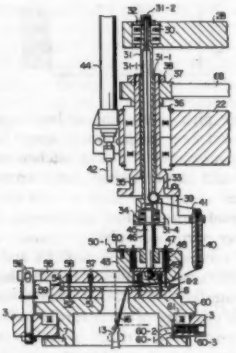
Tetsuo Orikasa, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 12, 1982, Ser. No. 407,485

Claims priority, application Japan, Aug. 14, 1981, 56-126736

Int. Cl.⁴ B21F *3/00*

U.S. Cl. 140—92.1 **10 Claims**



1. An armature coil winding apparatus for a flat motor, the armature coil winding apparatus comprising:

a frame means;

a rotary disc mounted on said frame means;

groups of pins provided on said rotary disc, said groups of pins being located at predetermined pitches and arranged on at least two concentric circles;

means connected to the rotary disc for rotating the rotary disc in an indexing operation;

a first winding jig disposed on said rotary disc having a guide section for winding a magnet wire on a plurality of specific pins selected from the groups of pins, said selected plurality of pins being arranged within a set of coils to be wound during a winding operation;

means for forming recesses in the first winding jig for receiving the selected plurality of pins;

a second winding jig located adjacent the first winding jig with a predetermined gap existing therebetween;

means disposed adjacent said first winding jig for guiding and feeding the magnet wire while rotating around the first winding jig; and

wherein the magnet wire is fed through the gap and wound on the selected plurality of pins.

4,549,584

PROCESS AND DEVICE FOR FILLING CHROMATOGRAPHY COLUMNS

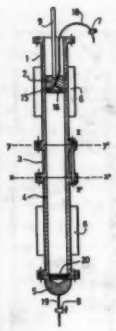
Daniel Morin, Orthez, and Roland Prechner, Pau, both of France, assignors to Societe Nationale Elf Aquitaine (Production), Courbevoie, France

Filed Oct. 5, 1983, Ser. No. 539,113

Claims priority, application France, Oct. 5, 1982, 82 16672

Int. Cl.⁴ B01D *15/08;* B65B *1/24*

U.S. Cl. 141—73 **18 Claims**



1. Apparatus for filling and packing a chromatographic column having a defined bore, said apparatus comprising:

a compression chamber having the same bore as said chromatographic column, said compression chamber being selectively attachable at and detachable from one end of said chromatographic column such that the interior of said compression chamber is aligned with the interior of said chromatogragraphic column to form a combined chamber;

a piston sealingly fitting in said compression chamber;

means for selectively moving said piston in said compression chamber toward and away from said chromatographic column;

means for closing the other end of said chromatographic column; and

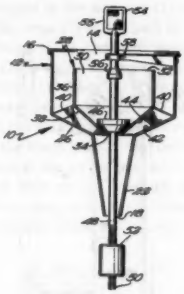
a conduit extending through at least one of said piston and said other end closing means through which a suspending liquid for packing particles for said chromatographic column may exit from said combined chamber

4,549,585

SELF MIXING FUNNEL

Hartley T. Emerson, 1509 11th St. South, Virginia, Minn. 55792

Filed Dec. 30, 1983, Ser. No. 567,049
Int. Cl.⁴ B67C *11/06*
U.S. Cl. 141—95 **14 Claims**



1. Self mixing funnel for mixing a first liquid with a second liquid comprising, in combination: an outer funnel portion having a first, enlarged filling open end, a second, reduced discharge open end, and an inside surface defining an interior; a liquid retainer having an enlarged filling open end, an outside surface, and an inside surface defining an interior, with the liquid retainer allowing discharge from the interior of the liquid retainer only by overflowing the filling open end of the liquid retainer, with the shape and size of the liquid retainer allowing the placement of the liquid retainer within the interior of the funnel portion, with the filling open end of the liquid retainer being smaller than the filling open end of the funnel portion; and means for suspending the liquid retainer within the interior of the outer funnel portion with the filling open end of the liquid retainer being below the filling open end of the funnel portion wherein the first liquid can be poured and retained within the interior of the liquid retainer and the second liquid can be poured into the interior of the liquid retainer for mixing with the first liquid and overflowing the filling open end of the liquid retainer into the interior of the funnel portion for discharge through the discharge open end of the funnel portion without overflowing the filling open end of the funnel portion; and wherein the suspending means comprises, in combination: webs extending between the inside surface of the funnel portion and the outside surface of the liquid retainer.

4,549,586

DEVICE FOR SHAVING WOOD WITH CYLINDER SAWS

Leo Klocker, Bongern 10, A6850 Dornbirg, Austria

Filed Mar. 14, 1983, Ser. No. 475,155
Int. Cl.⁴ B27C *9/04*
U.S. Cl. 144—3 R **9 Claims**

1. A device for forming the exterior of wooden beams of indeterminate axial length, said device comprising:

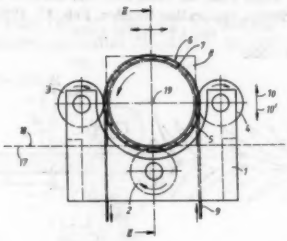
at least one drum-like cylindrical saw (6) through the center of which the beam passes from a feed end to a discharge end, said saw having a circular toothed arrangement (7) on said feed end for forming said beam;

a frame (1) having an upwardly open recess (5) for receiving said cylindrical saw (6);

a support roller (2) mounted in said frame (1) beneath said cylindrical saw when same is placed in said recess, said support roller engaging the exterior of said cylindrical saw from beneath for rotatably supporting said cylindrical saw (6) in said frame (1) in a radially and axially unshiftable manner;

a pair of laterally spaced guide rollers (3, 4) mounted in said frame (1) on either side of said cylindrical saw (6) when same is placed in said recess (5), said guide rollers (3, 4) engaging the exterior of said cylindrical saw (6) from opposite sides for coupling said cylindrical saw (6) to said frame (1) in a radially and axially unshiftable manner;

drive means including an endless belt (9) engaging the exterior of said cylindrical saw (6) on an upper portion opposite that engaged by said support roller (2) for rotating said cylindrical saw; and



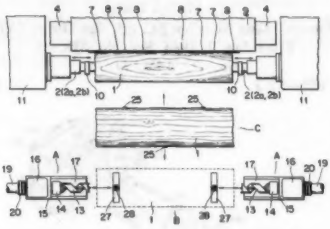
a feed table (17) adjustable in height for axially feeding the beam to said cylindrical saw.

4,549,587

VENEER LATHE

Katsuji Hasegawa, Nagoya, and Yasuhiro Ibuki, Ohbu, both of Japan, assignors to Meinan Machinery Works, Inc., Ohbu, Japan

Filed May 16, 1983, Ser. No. 495,113
Claims priority, application Japan, May 14, 1982, 57-081976
Int. Cl.⁴ B27L *5/00*; B27B *1/00*
U.S. Cl. 144—209 R **10 Claims**



1. A veneer lathe for cutting off veneer sheets from a log comprising

a boring unit having a woodworking drill to bore the log at a central portion thereof;

a centering unit provided at a first position in association with said boring unit for centering the log;

spindle means to be inserted into the bored log to support the same rotatably at a second position, said spindle means being provided in parallel to said wood-working drill and adapted for longitudinal movement into and out of said bored log;

conveying means for conveying the bored log from said first position to said second position;

rotary drive means having piercing means therearound and parallelly disposed in facing relation to said log;

a cutting knife having a cutting edge in parallel alignment with said log and the rotary drive means;

pressure means provided slightly ahead of the cutting knife for pressing the log; and

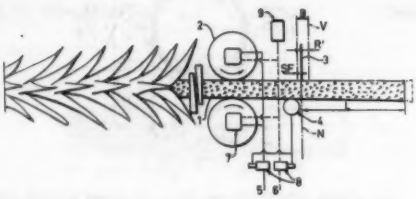
means for guiding said spindle means upon said longitudinal movement thereof and stopping accompanying movement of the log.

4,549,588

METHOD AND AN APPARATUS FOR CROSS-CUTTING TREE STEMS TO PRE-DETERMINED LENGTHS

Torsten E. Forslund, Alfta, Sweden, assignor to Osa AB, Alfta, Sweden

Filed Feb. 16, 1984, Ser. No. 580,599
Claims priority, application Sweden, Feb. 17, 1983, 8300888
Int. Cl.[4] B27B *1/00*
U.S. Cl. 144—356 5 Claims



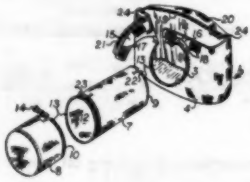
1. A method for the cross-cutting of timber to predetermined lengths comprising advancing timber towards a cross-cutting tool, measuring said predetermined length during advancing of the timber, producing an impulse corresponding to said predetermined lengths at a cross-cutting saw and to brake the advancing timber, accumulating the braking energy from the braking of the timber, using said accumulated energy to return the timber to the position corresponding to the predetermined length at the cutting saw, and cutting the timber at the predetermined length.

4,549,589

CAMERA CASE

Tan V. Nguyen, 4465 Missippi St., #5, San Diego, Calif. 92116

Filed Jun. 7, 1984, Ser. No. 618,081
Int. Cl.[4] A45C *11/38*
U.S. Cl. 150—52 J 8 Claims



1. A camera and lens case comprising in combination:

a camera body cover of crushable or foldable material for releasably covering a camera body, said cover comprising a top having a slot opening and slide fastening means for closing said opening, and a front having a circular opening for receiving a camera lens with first slide fastener means surrounding said opening, and flap means including releasable flap securing means defining an opening between said slot opening and said circular opening; and

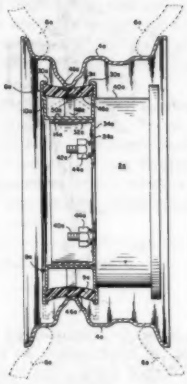
at least two cylindrical lens covers, each having a closed end and an open end and second slide fastener means surrounding the open end thereof and at least one of said lens covers having third slide fastener means surrounding the closed end, said second fastener means selectively cooperating with said first slide fastener means for covering a lens on a camera in said camera body cover and with said third fastener means for supporting another lens on the end of said one cover.

4,549,590

RESILIENT WHEELS

Edward H. Sahagian, 67 Chester St., Arlington, Mass. 02174

Filed Mar. 16, 1984, Ser. No. 590,212
Int. Cl.[4] B60B *9/12*
U.S. Cl. 152—41 4 Claims



1. A resilient wheel having:

a tire rim,

a cylindrical, cup-shaped hub,

an annular channel of substantially U-shaped cross-section secured to the exterior circumference of the cup-shaped hub with the circumferential opening of the channel facing radially outward of the hub,

a one-piece, annular, elastomeric member fitted in the circumferential opening of the channel creating a shock absorbing sealed air space defined by the inner surface of the elastomeric member and the interior surfaces of the U-shaped channel,

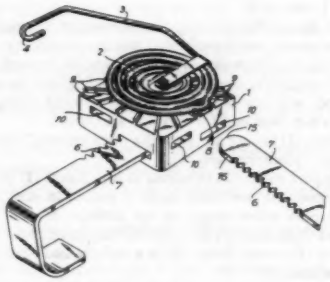
the tire rim being attached only to the exterior surface of the elastomeric element whereby shocks imparted to the rim are absorbed by the elastomeric member and the air sealed within the channel.

4,549,591

DEVICE FOR FITTING AND FIXING GRIPPING SHOES ON VEHICLE WHEELS

Egil E. Hyggen, Oslo, Norway, assignor to Elkem a/s, Norway

Filed Jun. 29, 1984, Ser. No. 626,282
Claims priority, application Norway, Jul. 5, 1983, 832451
Int. Cl.[4] B60C *27/20, 27/12*
U.S. Cl. 152—218 12 Claims



1. A device for fitting and fixing gripping shoes on vehicle

wheels, in which four gripping shoes are fitted at the one end of respective arms (7) which arms (7), after being fitted onto the wheel, form a cross, and the other ends of which arms (7) are toothed (6) and are slidably suspended in their longitudinal direction relative to a housing (1) centrally situated with respect to the wheel, and movable with the help of a gear wheel (5), rotatably arranged in the housing (1), which engages with the teeth (6) on the arms (7) and which is rotated by means of an operating mechanism (2), characterized in that the centrally situated housing (1) is made in one piece, in which said centrally situated housing (1) there are arranged four channels (10) for suspending and guiding the arms (7) of the gripping shoes, said channels (10) running from the lower part and in the same plane on each of the short sides of the central situated housing (1) and running out at the upper part and in the same plane on the opposite short sides of the centrally situated housing (1), the channels (10) running at an angle between 7° and 15° with respect to the horizontal plane of the centrally situated housing (1).

4,549,592

ROLLER FOR MOVING EQUIPMENT, FURNITURE OR THE LIKE

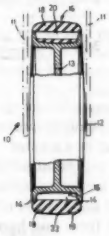
Dieter Schröder, Wermelskirchen, Fed. Rep. of Germany, assignor to Paul Vom Stein & Co., Wermelskirchen, Fed. Rep. of Germany

Filed Dec. 6, 1982, Ser. No. 446,973

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1981, 3148313

Int. Cl.⁴ B60C *7/00*

U.S. Cl. 152—328 **1 Claim**



1. A floor-engaging roller for moving equipment comprising:

a rim provided with a pair of outwardly extending annular flanges and a wheel body carrying said rim for moving same on an axle; and

a unitary one-piece tire mounted on said rim, said tire being composed of polyurethane elastomer and having a radially inner portion lying wholely between said flanges against said rim and a radially outer portion lying wholely outwardly of said flanges in a radial direction and substantially flush laterally with outer surfaces thereof, said radially inner portion substantially filling said rim between said flanges and being provided with a plurality of angularly equi-spaced bores extending completely through said radially inner portion adjacent said radially outer portion and in a direction parallel to an axis of rotation of the rim on said axle, said bores lying wholely within the circumference of said flanges so as to be closed thereby while providing elasticity for the tire, the radial thickness of said radially inner portion being at least equal to half the radial thickness of the tire.

4,549,593

PNEUMATIC TIRES

Mitsuhisa Yahagi, Sayama; Mikio Masunaga, Kodaira; Shuichi Watanabe, Tokyo, and Tsutomu Tanaka, Kodaira, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Dec. 21, 1983, Ser. No. 564,101

Claims priority, application Japan, Dec. 28, 1982, 57-231029

Int. Cl.⁴ B60C *5/14*

U.S. Cl. 152—330 R **8 Claims**

1. A pneumatic tire comprising a carcass composed of at least one ply, and an inner liner disposed in direct contact with said carcass over the substantially whole region of the inner surface thereof and composed of plural rubber layers, characterized in that said inner liner comprises at least three rubber layers including an outermost layer adjacent to the carcass, an innermost layer facing the inner space of the tire, and an intermediate layer interposed between said outermost and innermost layers, and that said innermost layer is disposed at at least shoulder portions of the tire and composed of a rubber composition containing 15–60 parts by weight of natural rubber and the balance of a halogenated butyl polymer as a rubber component, and that said intermediate layer is composed of a rubber composition containing only a halogenated butyl polymer as a rubber component, which is different from that of said outermost layer in the rubber component.

4,549,594

COMPOSITIONS HAVING A BASE OF SULFUR-VULCANIZABLE RUBBER

Christian Ancel, Monton, and Pierre Philibert, Mirefleurs, both of France, assignors to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Continuation of Ser. No. 355,885, Mar. 8, 1982, abandoned. This application Apr. 18, 1984, Ser. No. 601,501

Claims priority, application France, Mar. 16, 1981, 81 05367

Int. Cl.⁴ B60C *1/00*; B32B *15/06*

U.S. Cl. 152—359 **12 Claims**

1. An assembly comprising at least one rubber composition and at least one solid body at least the surface of which is zinc or brass, the rubber composition being in contact with the solid body wherein the rubber composition is characterized by the following features and properties:

(a) it comprises a basic formulation containing at least one sulfur-vulcanizable rubber and from 1 to 10 parts by weight of sulfur, per 100 parts by weight of rubber;

(b) it further comprises from 0.1 to 2 parts by weight of nickel, present in the form of nickel (II) acetylacetonate, per 100 parts by weight of rubber;

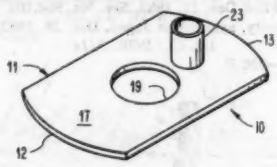
(c) the rubber composition and the basic formulation have substantially the same hysteresis loss when vulcanized under the same conditions.

4,549,595

TIRE CHANGER ADAPTER

John M. Kemper, R.R. 1, Box 1, Worthville, Ky. 41098

Filed Jul. 12, 1984, Ser. No. 630,224
Int. Cl.[4] B60C 25/00
U.S. Cl. 157—1 20 Claims



1. An adapter for use with a rim having a large central opening and no lug holes to enable dismounting of a tire from the rim or mounting of the tire on the rim by a tire changer requiring a rim to have lug holes around a central opening including:

a substantially flat plate having a selected shape, said flat plate having its opposite ends resting on diametrically disposed portions of a rim having a large central opening and no lug holes and from which a tire is to be dismounted or on which a tire is to be mounted;

said flat plate having an opening extending therethrough to receive a threaded shaft or the like of a tire changer on which the rim is to be supported, said opening having a size to cooperate with retaining means of the tire changer secured to the threaded shaft to enable the retaining means to hold said flat plate against the rim supported on the tire changer;

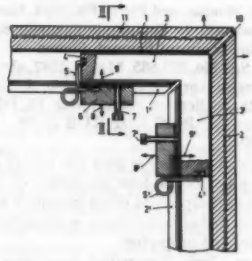
and said flat plate having means cooperating with a positioning pin of the tire changer supporting the rim and extending through the large central opening of the rim to prevent rotation of the rim, any tire mounted on the rim, and said flat plate when force is applied to each side wall of the tire by the tire changer to dismount the tire from the rim or to mount the tire on the rim.

4,549,596

DEVICE FOR TENSIONING MATERIAL ON FRAMES

Giorgio Staro, Via Besso 44, 6900 Lugano, Switzerland

Filed Aug. 17, 1983, Ser. No. 523,882
Claims priority, application Switzerland, Sep. 2, 1982, 5209/82
Int. Cl.[4] G09F 1/12; A47G 1/00
U.S. Cl. 160—374.1 5 Claims



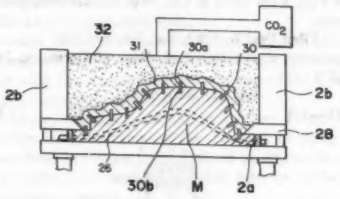
1. Device for tensioning materials on frames, comprising a pair of elongated hollow sections disposed at an angle to each other, an insert having two legs, one leg being disposed within one of said sections and the other leg being disposed within the other of said sections, a spring at each end of said insert, each spring having one leg that extends within the associated said section and bears against one end of the insert and another leg extending outside said associated section, and means acting between said another leg and said associated section to stress the spring to cause said one leg to press against said end of said insert, and at the same time said means pressing against said associated section so as to urge said sections apart from each other in a direction transverse to their length.

4,549,597

METHOD OF MANUFACTURING DURABLE METAL MOLDS BY METAL MELT-SPRAYING

Masuzo Hamamura, 10-10, Higashiawaji 2-chome, Higashiyodogawa-ku, Osaka-shi, Osaka-fu, Japan

Filed Sep. 15, 1983, Ser. No. 532,567
Claims priority, application Japan, Sep. 16, 1982, 57-161998; Jul. 27, 1983, 58-137955
Int. Cl.[4] B22D 9/02, 23/00
U.S. Cl. 164—35 19 Claims



11. A method of manufacturing durable metal molds by metal melt-spraying, which comprises the steps of:

placing a first model in a frame;

spraying a low melting point metal onto the surface of said model to form a hardened metal layer;

forming an inverted mold made of said metal layer by separating said model from said hardened metal layer;

pouring a molten low melting point metal into a concave portion of said inverted mold;

permitting the molten metal to cool and solidify;

separating the cooled and solidified metal from said inverted mold to form a second model;

fixing the second model on a metal surface plate;

surrounding the peripheral portion of said second model by a frame or mold base;

spraying a high melting point metal onto said second model to form a metal mold;

removing said second model from said mold by melting it to obtain a metal mold which is an integral structure with said frame or mold base;

filling a mixture of sand and sodium silicate into a concave spaced of said metal mold;

introducing carbon dioxide gas into said mixture to form a solid sand lump;

applying a supporting layer at the rear side of said integral structure;

embedding a cooling pipe in said supporting layer; and

removing said solid sand lump from said concave space of said integral structure to obtain a final metal mold having a supporting layer.

4,549,598

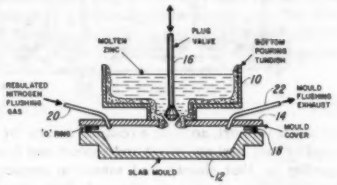
PROCESS FOR MINIMIZING FOAM FORMATION DURING FREE FALLING OF MOLTEN METAL INTO MOULDS, LAUNDERS OR OTHER CONTAINERS

Edouard Gervais, Montréal, and Henri Levert, Lachine, both of Canada, assignors to Noranda Inc., Pointe-Claire, Canada

Continuation-in-part of Ser. No. 331,755, Dec. 17, 1981, abandoned, which is a continuation of Ser. No. 178,584, Aug. 15, 1980, abandoned. This application Nov. 22, 1982, Ser. No. 443,683

Int. Cl.⁴ B22D *23/00*

U.S. Cl. 164—66.1 **7 Claims**



1. A process for minimizing foam formation on the surface of molten metal zinc which forms a foam during free falling of the molten metal zinc into moulds, launders or other containers, so as to eliminate the need for skimming, which comprises:

(1) forming a body of molten metal zinc having a substantially dross-free surface;

(2) introducing a non-oxidizing gas into said container to form an essentially non-oxidizing atmosphere with respect to said molten metal zinc;

(3) free falling said molten metal zinc having a substantially dross-free surface from said body of molten metal zinc into said container so as to eliminate the need for skimming dross from the surface of said molten metal zinc after free falling of said molten metal zinc into said container, and

(4) maintaining said molten metal zinc during said free falling thereof under an essentially non-oxidizing atmosphere so as to prevent entrainment of sufficient oxygen into said molten metal zinc by said falling stream to form excessive quantities of bubbles having a tenacious oxidized film and which do not collapse when they float to the surface of said molten metal zinc but rather produce undesirable foam on said surface, so as to eliminate the need for skimming foam from said surface.

4,549,599

PREVENTING MOLD AND CASTING CRACKING IN HIGH RATE DIRECTIONAL SOLIDIFICATION PROCESSES

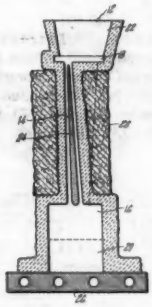
Martin J. Reiner, South Windsor, and Michael H. Fassler, Portland, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 952,904, Oct. 19, 1978, abandoned, which is a continuation-in-part of Ser. No. 731,409, Oct. 12, 1976, abandoned. This application Mar. 17, 1980, Ser. No. 131,291

Int. Cl.⁴ B22C *25/06*

U.S. Cl. 164—122.1 **2 Claims**

1. A solidification process for making columnar grain or single crystal metal castings which comprises placing vertically on a chill plate a ceramic shell mold having an open end resting on the chill plate, the mold having sections of varying surface area to volume ratio along its vertical length; heating the mold to an elevated temperature in a heating zone; pouring molten metal into the mold; gradually withdrawing the chill plate and mold vertically from the heating zone into a cooling zone so that heat is removed laterally and vertically from the molten metal; said vertical motion causing a high thermal gradient to move through the molten metal which thereby causes high rate directional solidification along the vertical length of the mold; characterized by applying insulation to a first mold section having increased surface area to volume ratio as compared to neighboring sections along the length of the mold, to decrease lateral heat flow during the heating and cooling steps, the insulation being of a thickness which is sufficient to lower the temperature differential between the



first mold section and the neighboring sections to a level that produces a crack free mold upon heating and a crack free casting upon cooling, and which is insufficient to change the direction of solidification in the first mold section upon cooling from that caused by the vertical motion; and, concurrently maintaining the neighboring mold sections in uninsulated condition.

4,549,600

PLANT FOR THE PRODUCTION OF CASTINGS IN A STEPWISE ADVANCED CASTING MOULD CONSISTING OF IDENTICAL, FLASKLESS MOULD PARTS

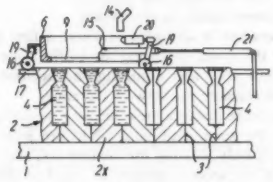
Hakon Kauserud, Ballerup, Denmark, assignor to Dansk Industri Syndikat A/S, Herlev, Denmark

Filed Feb. 25, 1983, Ser. No. 469,984

Claims priority, application Denmark, Mar. 2, 1982, 888/82

Int. Cl.⁴ B22C *9/20*

U.S. Cl. 164—323 **6 Claims**



1. A plant for the production of castings in a casting mould stepwise advanced through a pouring and cooling guideway and of the type consisting of identical, flaskless mould parts which are joined to form vertically divided moulds provided with a casting cavity associated with an inlet which is open at the upper side of the mould, said plant comprising:

an obstruction for the inlets which temporarily covers the inlets;

a tundish located above said guideway having a bottom outlet which is an elongate slit disposed in the longitudinal direction of said guideway and of a size to communicate simultaneously with three successive obstructed mould inlets, said tundish being movable away from a batch filling position by engagement with the upper side of the casting moulds until said obstructions have been removed and the batch pouring has been effected; and

a moving means for moving said tundish backwards to the filling position to communicate with a following set of obstructed inlets, said moving means including a means for automatically disengaging said tundish from the upper side of the casting mould during each backward movement of said tundish.

4,549,601

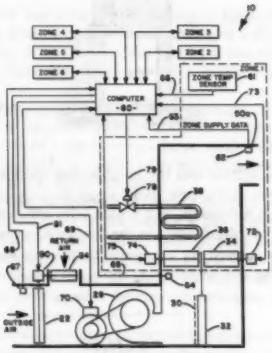
VARIABLE VOLUME MULTIZONE SYSTEM

Donald C. Wellman, Marcellus, and William E. Clark, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Continuation-in-part of Ser. No. 390,606, Jun. 21, 1982, Pat. No. 4,495,986. This application Dec. 19, 1983, Ser. No. 562,912

Int. Cl.⁴ F25B *29/00*

U.S. Cl. 165—2 **7 Claims**



1. A method for operating a variable volume multizone system having a variable volume air supply and a plurality of zones with each of said plurality of zones having a first damper for controlling the flow of air into the zone from the variable volume air supply through a cooling coil, a second damper for controlling the flow of air into the zone from the variable volume air supply through a heating coil and means for heating the heating coil including the steps of:

sensing the temperature in each zone;

if the temperature in any zone is above a first adjustable set point for the zone, supplying air to the zone through the cooling coil only and adjusting the position of the first damper to regulate the flow to the zone;

if the temperature in any zone is below a second adjustable set point for the zone, supplying air to the zone through the heating coil only, heating the heating coil and adjusting the position of the second damper to regulate the flow to the zone; and

if the temperature in any zone is below said first adjustable set point and above said second adjustable set point supplying air to the zone through the unheated heating coil and adjusting the position of said second damper so as to maintain an adjustable minimum flow into the zone.

4,549,602

RACK ASSEMBLY FOR PLUG-IN MODULES

H. Cesar Espinoza, Buena Park, Calif., assignor to Hollingsead International, Inc., Santa Fe Springs, Calif.

Filed Mar. 28, 1983, Ser. No. 479,327

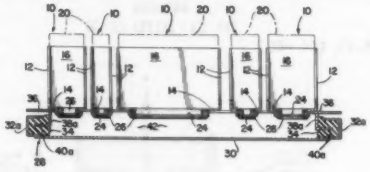
Int. Cl.⁴ F28F *7/00*

U.S. Cl. 165—80.2 **15 Claims**

1. A rack assembly for receiving at least one plug-in module and for providing mechanical isolation for the module from a structural support and for further providing cooling air to the module, said assembly comprising:

tray support means for defining a support surface for the module;

a mechanical isolator including (i) first and second parallel elongated beams connected to opposite ends of said tray support means, (ii) third and fourth parallel elongated beams extending adjacent to and substantially the entire length of the first and second beams, respectively, the third and fourth beams being arranged to be secured to the



structural support, and (iii) a resilient means for resiliently coupling said first and third and second and fourth beams together so that shocks and vibration imparted to the structural support must pass through the resilient means in order to reach the tray support means and module supported thereon and plenum means for forming an air plenum adjacent said support means, with said air plenum being formed in part by said mechanical isolator.

4,549,603

HEAT EXCHANGING DEVICE WITH HEAT EXCHANGING PLATES

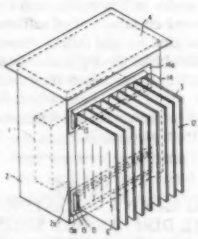
Mitsuru Shirai; Nobuo Fukuda; Akira Yamamoto, and Hiroshi Tsuji, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 28, 1983, Ser. No. 566,447

Claims priority, application Japan, Mar. 8, 1983, 58-34350

Int. Cl.⁴ F28F *9/26*

U.S. Cl. 165—104.33 **2 Claims**



1. A heat exchanger for a heat generating unit (1) mounted within a fluid enclosure (2), comprising:

(a) spaced upper and lower flanges (14*a*, 15*a*), horizontally elongate connecting manifolds (14, 15) mounted around horizontally elongate upper and lower first openings in a sidewall (2*a*) of the enclosure, said manifolds thus communicating directly with the interior of the enclosure, and each having an outer wall projecting horizontally outwardly from the enclosure sidewall and defining a plurality of spaced, horizontally aligned, vertically oriented second openings (16), and

(b) a plurality of spaced, parallel, horizontally aligned and vertically oriented, substantially rectangular heat exchanging plates (12) each defining a plurality of vertical internal fluid flow passages integral and unitary with and openly communicating at tops and bottoms thereof with respective upper and lower horizontal plenums, said plenums individually defining respective vertically oriented third openings (13) at upper and lower corners of one side of said plates, said third openings being matingly config-

ured to said second openings, and said plates being individually and sealingly mounted to said upper and lower manifolds such that said second and third openings are coextensive and define through passages communicating between the interiors of the enclosure and the respective plates, the outer wall of each manifold projecting horizontally outwardly from the enclosure sidewall only a small fraction of the horizontal width of the plates.

4,549,604

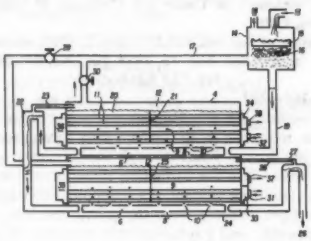
STEAM ABSORBER

William G. Brown, II, 720 N.W. 31st St., Corvallis, Oreg. 97330

Continuation-in-part of Ser. No. 122,357, Feb. 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 816,501, Jul. 17, 1977, abandoned, which is a continuation-in-part of Ser. No. 788,207, Apr. 18, 1977, abandoned. This application Apr. 18, 1983, Ser. No. 486,087

Int. Cl.⁴ F28B *1/00*

U.S. Cl. 165—110 **4 Claims**



1. A steam absorber apparatus comprising:

an absorption chamber means suitable for holding a liquid desiccant in contact with a heat transfer means;

a heating chamber means suitable for holding water in contact with said heat-transfer means;

a heat-transfer surface means for thermally contacting said absorption chamber means with said heating chamber means comprising a tube;

a steam injector means suitable for injecting steam into said absorption chamber for absorption into said liquid desiccant;

a liquid level control means suitable for maintaining sufficient depth of said desiccant to submerge at least a portion of said tube and said injector means such that the major portion of said steam is injected below the surface of said liquid desiccant at a depth of less than half the horizontal extent of said tube to cause relatively low back pressure in said steam injector means while using a relatively long tube.

4,549,605

SINGLE INLET/OUTLET-TANK U-SHAPED TUBE HEAT EXCHANGER

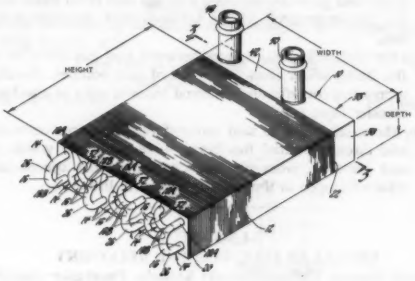
Demetrio B. Sacca, Lockport, and Donald E. Hoffman, West Seneca, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 20, 1984, Ser. No. 642,099

Int. Cl.⁴ F28F *9/26*

U.S. Cl. 165—150 **2 Claims**

1. A heat exchanger comprising a tank having a header plate, a plurality of tubes each having two legs joined by a return bend, the legs of said tubes extending through and terminating with an open end at one side of said header plate, a first group of said tubes being arranged so as to each have their two open ends located in one and the other of two outboard rows extending longitudinally of said header plate, a second and remaining group of said tubes having a return bend radius smaller than that of said first group and resultantly closer together legs and being arranged in pairs with their return bends between those of the tubes in said first group so that one open end of each of the tubes in each said pair is located in one of said outboard rows and the other open end of each of the tubes in each said pair is located in a third and inboard row extending between said two outboard rows, and partition means in said tank for



cooperating with said header plate to define an inlet chamber and an outlet chamber in said tank open respectively to the open tube ends in one and the other of said two outboard rows and also to alternate ones of the open tube ends in said inboard row whereby each said tube is connected to effect two-pass flow between said chambers.

4,549,606

HEAT TRANSFER PIPE

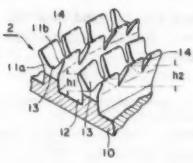
Yoshiyuki Sato, and Akio Isozaki, both of Kanagawa, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Sep. 2, 1983, Ser. No. 528,795

Claims priority, application Japan, Sep. 8, 1982, 57-137119[U]; Nov. 30, 1982, 57-210370

Int. Cl.⁴ F28F *1/42*

U.S. Cl. 165—179 **11 Claims**



1. A heat transfer pipe comprising:

(a) an axially hollow cylindrical heat transfer pipe body and

(b) a plurality of circumferential fins integrally formed on the outer surface of said cylindrical heat transfer pipe body at a first regular circumferential pitch which leaves a circumferential space between said circumferential fins, each of said circumferential fins having a circumferential axis extending circumferentially around said cylindrical heat transfer pipe body;

(c) the radially outer portion of each of said circumferential fins having at least one groove extending along the axial length of said circumferential fin to divide the radially outer portion of said circumferential fin into at least two parts separated by said at least one groove,

(d) each of said circumferential fins also having a plurality of notches therein interrupting the axial length of said circumferential fins and dividing said circumferential fins into a number of parts,

(e) a plurality of discrete beads being formed on the inner surface of said axially hollow cylindrical heat transfer pipe body along imaginary circumferential lines, said beads

being formed at points directly radially underlying at least some of said circumferential fins,

(f) the depth of said notches in the radial direction being greater than the depth of said at least one groove, whereby condensate on the exterior of said heat transfer pipe does not remain in said grooves but instead flows from said grooves into said notches and from there into the circumferential spaces between said circumferential fins,

(g) the circumferential spaces between said circumferential fins being wider than the width of said notches, thereby increasing the effective thermal transfer area of the heat transfer pipe, and

(h) the axial width of said circumferential spaces between said circumferential fins being wider than the width of said grooves, whereby said circumferential spaces are relatively open in the radially outward direction.

4,549,607

MICELLAR SLUG FOR OIL RECOVERY

Hiroshi Morita, Chiba; Yasuyuki Kawada, Funabashi; Junichi Yamada, Narashino, and Toshiyuki Ukigai, Chiba, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Jul. 18, 1983, Ser. No. 514,788

Claims priority, application Japan, Jul. 19, 1982, 57-124498

Int. Cl.⁴ E21B *43/16*

U.S. Cl. 166—274 **13 Claims**

1. A micellar slug for use in the recovery of oil, said slug consisting essentially of a hydrocarbon, an aqueous medium, a surfactant, and a cosurfactant, said surfactant containing, as an essential component, (a) at least one internal olefin sulfonate having 10 to 30 carbon atoms and (b) at least one alpha-olefin sulfonate having 10 to 30 carbon atoms wherein the ratio of (a)/(b)=95/5 to 10/90.

4,549,608

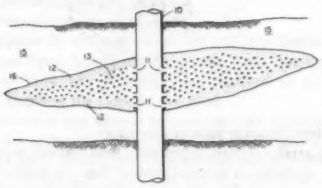
HYDRAULIC FRACTURING METHOD EMPLOYING SPECIAL SAND CONTROL TECHNIQUE

Lawrence R. Stowe, Plano, and Malcolm K. Strubhar, Irving, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 12, 1984, Ser. No. 630,177

Int. Cl.⁴ E21B *43/267*

U.S. Cl. 166—280 **7 Claims**



1. A sand control method for use in a borehole having an unconsolidated or loosely consolidated oil or gas reservoir which is otherwise likely to introduce substantial amounts of sand into the borehole, comprising:

(a) providing a borehole casing through said unconsolidated or loosely consolidated oil or gas reservoir,

(b) perforating said casing at preselected intervals therealong to form at least one set of longitudinal, in-line perforations,

(c) hydraulically fracturing said reservoir by injecting a fracturing fluid containing a fine grain sand and a clay stabilizing agent through said perforations at a volume and rate to allow said stabilizing agent to penetrate the fracture face along its entire length at a depth sufficient to overcome the effects of fluid velocity increases in oil or gas production flow on the movement of clay particles or fines located near the fracture face into the fracture as such production flow linearly approaches said fracture face,

(d) injecting a proppant comprising a gravel packing sand into said fracture so that said gravel packing sand pushes said fine grain sand up against the face of the fractured reservoir, whereby a first layer of fine grain sand is held in place along the entire face of said fracture by a second layer of gravel packing sand also extending along the entire length of said fracture to prevent the migration of clay particles or fines from said reservoir into said fracture, and

(e) producing oil or gas from said reservoir through said fracture into said borehole casing.

4,549,609

TREATING FINES-CONTAINING EARTHEN FORMATIONS

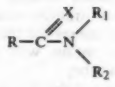
David R. Watkins, Irvine; Robert K. Knight; Donald C. Young, both of Fullerton, and Leonard J. Kalfayan, Claremont, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 528,877, Sep. 2, 1983, abandoned. This application Aug. 15, 1984, Ser. No. 641,360

Int. Cl.⁴ E21B *43/24*

U.S. Cl. 166—303 **25 Claims**

1. A method for conditioning a fines-containing, earthen formation including both surface and subsurface strata, to increase the flow of fluids through the formation which comprises injecting into the formation steam containing an effective fines-stabilizing amount of a compound containing ammoniacal nitrogen selected from the group consisting of ammonium hydroxide, and a water-soluble ammonia or ammonium ion precursor selected from the group consisting of amides of carbamic acid and thiocarbamic acid, derivatives of such amides, tertiary carboxylic acid amides and their substituted and alkylated derivatives characterized by the formula:



wherein (1) R is hydrogen or an organic radical, (2) R_1 and R_2 are independently selected from hydrogen and organic radicals, and (3) X is oxygen or sulfur.

4,549,610

VEHICLE WITH FRONT AND REAR STEERABLE WHEELS INDIVIDUALLY DRIVEN BY HYDRAULIC MOTORS

Cornelis van der Lely, 7 Brüschenrain, Zug, Switzerland

Filed Jun. 2, 1980, Ser. No. 155,225

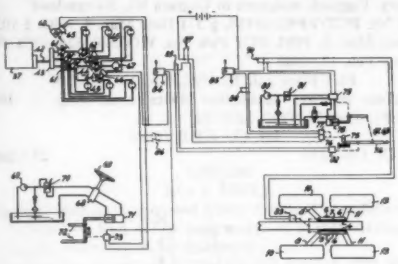
Claims priority, application Netherlands, Jun. 5, 1979, 7904380; Jun. 5, 1979, 7904381

Int. Cl.⁴ A01B *67/00, 63/112*

U.S. Cl. 172—3 **27 Claims**

1. A motor vehicle comprising a power source and driven ground engaging members, and having a lifting device for attachment of further equipment to the vehicle, automatic control means being provided for controlling the transmission of power from said power source to driven ground engaging members of the vehicle in response to forces applied to the lifting device, said control means including a first sensor coupled with an arm of the lifting device, the output of said first sensor representing tractive force exerted by the vehicle on equipment hitched to said lifting device, this output being applied to said automatic control means, said control means further including a second sensor coupled with said lifting device, the output of said second sensor representing the magnitude of the deflection of a portion of said lifting device with respect to the rest of the vehicle and being applied to a valve

for controlling a lifting arm of the lifting device, said control means operating to reduce the vehicle's speed automatically



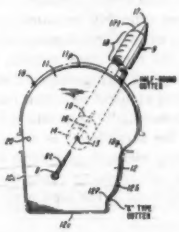
upon an increase in resistance applied by equipment hitched to the lifting device and to cause the equipment to be raised when the resistance reaches a limit value.

4,549,611

MULTI-PURPOSE HAND TOOL

Robert C. Mills, 249 Cedar Dr., West Milton, Ohio 45383

Filed Jul. 6, 1984, Ser. No. 628,402
Int. Cl.[4] E04D *13/06;* **A01B** *1/20*
U.S. Cl. 172—375 **10 Claims**



1. A multi-purpose tool for performance of at least a dozen or more tasks around a home, an office and the garden basically as (A) a gutter clean-out tool adapted to fit (a) narrow "K" type gutters; (b) wide "K" type gutters; (c) narrow half-round gutters; and (d) wide half-round gutters as well as also including most other common types of gutter cross-sectional configurations; (b) additional applications including (e) a weeder in a garden; (f) a ditcher; (g) a hoe; (h) a spreader; (i) a row-forming tool; (j) a seed-bed tool; (k) a furrowing tool; (l) a deep-planting tool for bulbs, sets (onion, for example), and small plants; (m) a blending tool for mortar and plaster; (n) a hand tiller for mulch and dry chemicals; (o) a hand tamping tool for soil and sand; (p) a planting lateral-spacing gauge tool; (q) a planting depth-gauge tool; and (r) a scraper, said multi-purpose tool in combination therewith comprising:

a single face plate including a flat sheet metal body having a centrally located hole therethrough;

a first portion of said metal body having a half-round-curved periphery in a configuration adapted to fit into half-round gutters;

a second portion of said metal body having a more retangular peripheral contour conforming to inner shape of K-type gutters;

a handle having an axial end that abuts centrally against said flat sheet metal body of said single face plate and having a free end remote therefrom as well as having measuring graduations on said handle in location intermediate said ends; and

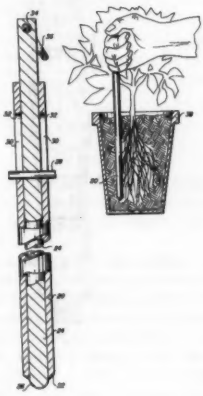
a fastening means inserted through the centrally located hole and into said axial end of said handle so that said free end as well as said measuring graduations and said face plate are available to fit (A) and for the additional applications (B).

4,549,612

SOIL SAMPLER

Nelson N. Cushing, Glendale, Ariz., assignor to Theresa Caldwell, Peoria, Ariz.

Filed Dec. 27, 1983, Ser. No. 565,719
Int. Cl.[4] E21B *25/00*
U.S. Cl. 175—20 **10 Claims**



1. An apparatus for removing soil samples from the root zone of a potted plant or the like, comprising:

a first longitudinal tubular member having upper and lower ends;

a second longitudinal member telescopically mounted within said first tubular member, said first tubular member, said second member having a blunt lower end which protrudes slightly beyond the lower end of said first tubular member when said apparatus penetrates through said root zone; and

first means for extracting said second member to raise said blunt lower end within said first tubular member such that further penetration of said apparatus will result in soil being deposited within said lower end of said first tubular member, said first means comprising a slot in said first tubular member proximate its upper end, and a protrusion fixedly coupled to said second member proximate its upper end and extending into said slot to define the limit of movement of said second member in said first tubular member, said slot extending to the upper end of said first tubular member to permit complete removal of said second member from said first tubular member.

4,549,613

DOWNHOLE TOOL WITH REPLACEABLE TOOL SLEEVE SECTIONS

Wayne A. Case, 2005 SW. 71st St., Portland, Oreg. 97225

Continuation-in-part of Ser. No. 403,483, Jul. 30, 1982, abandoned. This application Jul. 25, 1983, Ser. No. 515,987
Int. Cl.[4] F21B *17/10*
U.S. Cl. 175—325 **38 Claims**

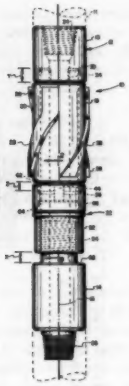
1. A downhole tool for connection to a drill stem as a section of said drill stem, said tool comprising:

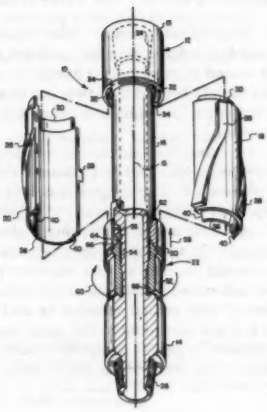
a body including means on at least one end of said body for connecting said body to said drill stem;

a plurality of tool sections mountable on said body and

removable from said body by moving said tool sections radially with respect to a central axis of said body and without disconnecting said body from said drill stem;

retaining means including means threadedly engaging said body and said tool sections and axially movable by rotation on the threads on said body between a locked position where said tool sections are secured on said body and an





unlocked position where the tool sections may be axially removed from the body, and stop means positioned on the body for limiting the axial movement of the retaining means at the unlocked position to prevent loss of said retaining means from said tool upon intentional movement to the unlocked position while removing the tool sections or accidental loosening while operating in a wellbore.

4,549,614

DRILLING DEVICE

Oscar W. Kaalstad, Winter Park, Fla., and Neil G. Reid, Aylesbury, England, assignors to Engtech SA, Switzerland

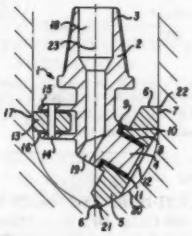
PCT No. PCT/EP82/00158, § 371 Date Mar. 8, 1983, § 102(e) Date Mar. 8, 1983, PCT Pub. No. WO83/00524, PCT Pub. Date Feb. 17, 1983

PCT Filed Jul. 26, 1982, Ser. No. 486,540

Claims priority, application Switzerland, Aug. 7, 1981, 5108/81; May 26, 1982, 3230/82

Int. Cl.⁴ E21B *10/18*

U.S. Cl. 175—339 **27 Claims**



1. A drill bit for use in drilling a well bore, which comprises:

a main body adapted to be rotated and defining a duct extending substantially longitudinally therethrough for supplying a drill fluid under pressure to the well bore;

a cutting element rotatably mounted to the main body and having its axis of rotation disposed at an angle to the axis about which the main body rotates, the cutting element being a disc having a ring-shaped cutting portion; and

a counter-reacting element mounted on the main body and positioned diametrically opposite the cutting element at substantially the same level as the cutting element, the counter-reacting element extending from the main body for a distance calculated to cause the cutting element to rest against the wall of the well bore.

4,549,615

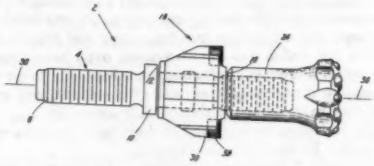
SINGLE-PASS NOTCHING AND DRILLING TOOL AND METHOD OF DRILLING A BLAST ROLE THEREWITH

Dah-Ben Liang, Greensburg, and Robert S. Gulibon, Stahlstown, both of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Filed Jul. 12, 1982, Ser. No. 397,423

Int. Cl.⁴ E21B *10/38, 10/40*

U.S. Cl. 175—389 **12 Claims**



1. A single-pass notching and drilling tool comprising: an adaptor having a first threaded end for coupling with a power source, an opposed second threaded end, an enlarged diameter portion adjacent to said first threaded end and having a first axial abutment face, and a mediate portion adjacent to said first axial abutment face and said second threaded end; a drill portion joined to said second threaded end of said adaptor and having a second axial abutment face; and a notching tool comprising a body having a central bore rotatably engaging said mediate portion of said adaptor, said notching tool freely rotatable about said mediate portion independent of the rotation of

said adaptor, the axial movement of said notching tool bounded by said first and second axial abutment faces.

4,549,616
ROCK DRILL

Gerhard Rumpp, Inning, and Dieter Scholz, Unterpfaffenhofen, both of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Fünstentum, Liechtenstein

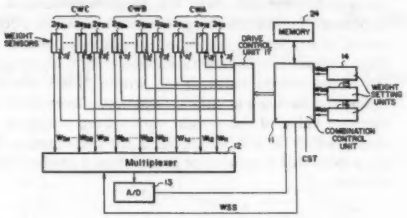
Continuation-in-part of Ser. No. 253,559, Apr. 13, 1981, Pat. No. 4,458,769. This application Apr. 5, 1984, Ser. No. 597,457
Claims priority, application Fed. Rep. of Germany, Apr. 16, 1980, 3014693
Int. Cl.[4] E21B *10/44*
U.S. Cl. 175—394 **6 Claims**

1. Rock drill comprising an axially elongated member having a cutting bit at one end, a shaft extending from said cutting bit toward the opposite end of said member, said shaft having an outside surface defining the radially outer surface of said shaft and at least one helically extending groove extending inwardly from said outside surface for conveying drill borings away from said cutting bit toward the opposite end of said member, and a shank extending from the opposite end of said member toward the end of said shaft remote from said cutting bit, in the axial section of said shaft said groove having a groove bottom extending parallel to the axis of said member and a flank closer to said cutting bit extending substantially perpendicular to the axis of said member, wherein the improvement comprises that said groove bottom at least for a part of the axial length of said shaft is divided in the axial direction into a plurality of sections each having a different depth inwardly from the outside surface of said shaft, said plural section part of said groove having a plurality of flanks spaced axially apart and extending substantially perpendicular to the axis of said member and including a first flank closest to said cutting bit, said first flank defining one side of a first said section of said groove having the greatest depth inwardly from the outside surface of said shaft and said first flank forms a continuous rectilinear line from the outside surface of said shaft to the bottom of said first section of said groove, the depth of said groove sections decreases in a stepwise manner inwardly from the outside surface of said shaft in the direction from said first flank toward the opposite end of said member, and said plural section part of said groove commences at a distance from said cutting bit in the range of three to seven times the diameter of said cutting bit.

4,549,617
COMBINATORIAL WEIGHING AND COMBINATORIAL COUNTING METHOD AND APPARATUS

Seishi Matsumoto, Tokyo; Takeo Nakashimizu, Itabashi, and Yuji Abe, Tokyo, all of Japan, assignors to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Jul. 27, 1982, Ser. No. 402,364
Claims priority, application Japan, Jul. 28, 1981, 56-118722
Int. Cl.[4] G01G *19/00, 19/22, 19/52*
U.S. Cl. 177—1 **15 Claims**



1. A combinatorial weighing method for obtaining a batch of articles of a plurality of categories, each category of articles in the batch having a predetermined weight, said method comprising the steps of:

(a) setting a target weight for each category of articles;

(b) supplying a plurality of groups of weighing machines, each of said groups of weighing machines being provided for a corresponding one of the categories of articles;

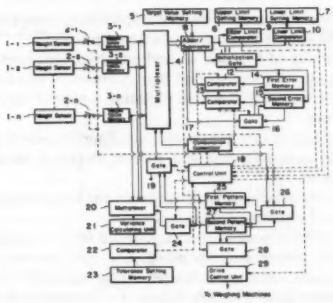
(c) selecting, for each category of articles and from all combinations of the weighing machines provided for said each category of articles, a best combination whose total weight is equal to the target weight set for that category or closest to the target weight within preset allowable limits; and

(d) discharging the articles from those weighing machines corresponding to the best combination obtained for each category of articles, whereby a batch composed of the discharged articles is obtained.

4,549,618
COMBINATORIAL WEIGHING METHOD AND APPARATUS

Katsuaki Kono, Ohtsu, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Jul. 20, 1983, Ser. No. 515,517
Claims priority, application Japan, Jul. 26, 1982, 57-131018
Int. Cl.[4] G01G *19/22, 19/52*
U.S. Cl. 177—25 **7 Claims**



1. A combinatorial weighing method comprising the steps of:

(a) supplying a plurality of weighing machines with articles to be weighed, each weighing machine producing a weight value corresponding to the weight of the articles weighed, and obtaining a plurality of acceptable combinations of said weighing machines, each acceptable weighing machine combination providing a combination of articles having a combined weight value equal or closest to a target weight value; and

(b) discharging articles from a single optimum combination of said weighing machines from among the plurality of acceptable combinations of said weighing machines, said optimum combination being one which provides a combination of articles, the combined weight value of said optimum combination having a minimum error with respect to the target weight value, being within preset allowable limits, and having a statistical dispersion, determined by a variance value of the weight values from weighing machines which do not participate in the combination, having a value that is equal to or greater than a predetermined tolerance.

4,549,619

COMBINATORIAL WEIGHING APPARATUS

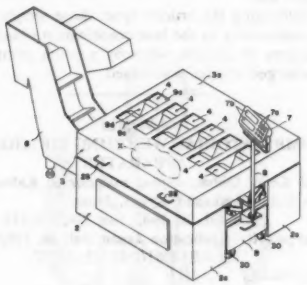
Atsushi Fujiwara, Kyoto, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Jul. 10, 1984, Ser. No. 629,567

Claims priority, application Japan, Jul. 11, 1983, 58-107979[U]; Jul. 12, 1983, 58-108565[U]; Jul. 13, 1983, 58-109460[U]; Jul. 13, 1983, 58-109461[U]; May 16, 1984, 59-72099[U]; May 18, 1984, 59-73638[U]

Int. Cl.⁴ G01G *19/22, 13/22, 13/34;* **B67D** *5/64*

U.S. Cl. 177—25 **20 Claims**



12. A combinatorial weighing apparatus, comprising:

a base having first and second base portions;

a plurality of first and second weighing machines provided on the first and second base portions, respectively, each first weighing machine opposing a second weighing machine;

a plurality of first and second weighing hoppers provided on corresponding first and second weighing machines, respectively;

an article supply table, provided on the base, having a plurality of charging inlets;

a plurality of pool hoppers suspended from the article supply table above corresponding first and second weighing hoppers, each pool hopper being movable between an intermediate position below a corresponding charging inlet, a first position located above the corresponding first weighing hopper and a second position located above the corresponding second weighing hopper.

4,549,620

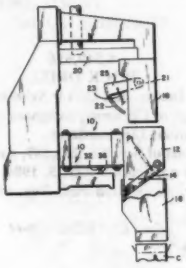
ELECTRONIC CONTROL SYSTEM FOR A WEIGHING SCALE

Gerald M. Dee, Milford, and Frank A. Catrambone, Quincy, both of Mass., assignors to Pneumatic Scale Corporation, Quincy, Mass.

Filed Aug. 22, 1983, Ser. No. 525,300

Int. Cl.⁴ G01G *13/26*

U.S. Cl. 177—60 **23 Claims**



22. An electronic pneumatic scale for repeatedly weighing flowable material in a scale bucket comprising:

spring means for suspending said scale bucket;

an air circuit having an opening aligned with said spring means such that the air pressure in said air current is responsive to the position of said spring means and thereby the weight on said bucket;

air pressure to voltage transducer means connected to said air circuit for producing a weight signal corresponding to the weight applied to said scale bucket;

means, responsive to the weight signal, for triggering the termination of said flow of material.

4,549,621

APPARATUS FOR SUPPORTING A TIMING HOPPER IN AN AUTOMATIC WEIGHING SYSTEM

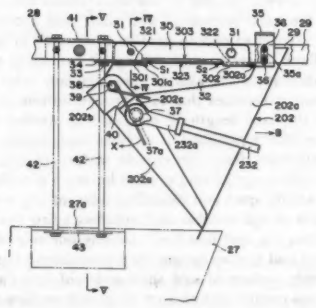
Kenji Ueda, Kyoto, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed May 11, 1984, Ser. No. 609,442

Claims priority, application Japan, May 13, 1983, 58-72009[U]

Int. Cl.⁴ G01G *13/16, 13/18, 23/00*

U.S. Cl. 177—105 **9 Claims**



1. An apparatus for supporting a hopper of an automatic weighing system, comprising:

a support frame having first and second frame members;

first and second support pieces secured to said first and second frame members, respectively, in such a manner as to form predetermined clearances with a lower surface of said first

and second frame members, said first and second support pieces each having two support portions;

first and second supported pieces attached to the hopper on respective outer sides thereof, said first and second supported pieces each having two insertion tabs corresponding to the two support portions on each of said first and second support pieces; and

limiting means for limiting movement of the hopper when the insertion tabs of the first and second supported pieces are inserted into said predetermined clearances.

4,549,622

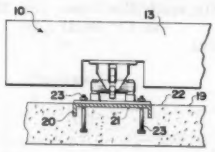
HEAVY DUTY WEIGH SCALE

Leslie L. Leiman, Dugald, Canada, assignor to Superior Scale Co. Ltd., Winnepeg, Canada

Filed Jun. 20, 1983, Ser. No. 505,877

Int. Cl.⁴ G01G *19/02, 3/14, 21/12*

U.S. Cl. 177—134 **15 Claims**



1. A heavy duty weigh scale for trucks, equipment and the like, mountable upon a concrete supporting base or the like and comprising in combination a substantially rectangular weighbridge component, and means operatively mounting said weighbridge component upon said base, said means including a plurality of load cell assemblies operatively supporting said weighbridge component upon said base, each load cell assembly including a load cell support means secured to said base, a double ended shear beam load cell secured by the ends thereof to said support means, a chair secured to the underside of said weighbridge and a suspension link plate operatively connecting said chair to said load cell intermediate the ends of said load cell whereby the vertical shearing force from said weighbridge is applied to said load cell in a zone intermediate the ends thereof, said load cell lying parallel to the longitudinal axis of the weighbridge component, said chair being operatively connected by to the said link plate on a longitudinal axis perpendicular to the longitudinal axis of the load cell thereby permitting free longitudinal movement of said weighbridge component, within limits, said link plate including a substantially rectangular, open centered upper portion and a support portion extending one upon each side of the base of said upper portion, bearing means on each of said support portions operatively supporting said chair, the longitudinal axis of said bearing means lying perpendicular to the longitudinal axis of said load cell, said supper portion having a pair of opposed faces and a pair of side walls, an upper wall, and a base wall, said walls defining the aperture through said upper portion from one face to the other face and further bearing means on said upper wall defining said aperture, operatively connecting said link plate to said load cell, said load cell including a medial groove formed thereon at least over the top portion thereof and being normal to the longitudinal axis of the load cell, said groove having a concave curvature when viewed in front elevation, said further bearing means being convexedly curved at least on the underside thereof, when viewed in cross section and also when viewed in front elevation, the curvature of said medial groove being greater than the curvature of said further bearing means whereby said bearing means engages said medial groove substantially tangentially, said medial groove and said bearing means on each of said support portions lying in a common vertical plane thereby forming a triangle of contact points preventing any substantial sideways movement of said weighbridge component.

4,549,623

APPARATUS FOR AUTOMATICALLY MONITORING A CONSTANT CURRENT SOURCE IN A MEASURING INSTRUMENT

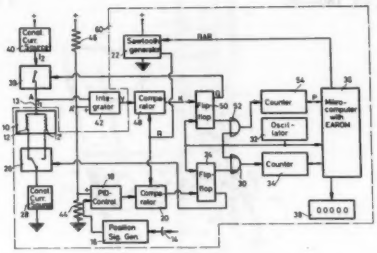
Arthur Baumann, Bertschikon, Switzerland, assignor to Mettler Instrumente AG, Greifensee, Switzerland

Filed Aug. 13, 1984, Ser. No. 639,627

Claims priority, application Switzerland, Sep. 29, 1983, 5275/83

Int. Cl.⁴ G01G *7/00;* **G01L** *1/08*

U.S. Cl. 177—212 **11 Claims**



1. In a measuring instrument having electromagnetic load compensation means comprising compensation coil means and means for furnishing a constant current to said compensation coil means:

apparatus for automatically generating an error signal when said constant current has a value outside a predetermined range of values, comprising

first means for generating a first current varying in dependence on said constant current and furnishing a first digital signal indicative of the value thereof; and

second means connected to said first means for furnishing a reference signal, for comparing said first digital signal to said reference signal, and for furnishing said error signal when said comparison is indicative of a value of said constant current outside said predetermined range of values.

4,549,624

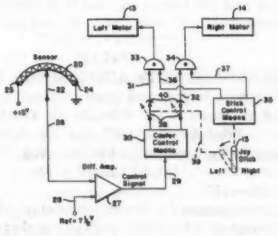
WHEELCHAIR DIRECTION CONTROL MEANS

Herbert M. Doman, Ventura, Calif., assignor to Everest & Jennings, Inc., Camarillo, Calif.

Filed Oct. 12, 1984, Ser. No. 660,074

Int. Cl.⁴ B62D *11/00*

U.S. Cl. 180—6.28 **7 Claims**



1. In a wheelchair including moving and steering power means,

(a) a caster wheel having a stem rotatably mounted on said wheelchair, said caster wheel engaging the terrain over which the chair travels; and

(b) means responsive to turning of the caster wheel stem as a result of turning of the wheelchair from a straight line course due to uneven terrain, connected to the power steering means to turn the chair back to its original straight line course.

4,549,625

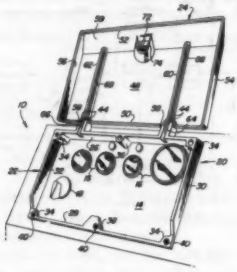
INSTRUMENT PANEL COVER ASSEMBLY

Gary W. Tindall, Hazel Green, Wis., assignor to Deere & Company, Moline, Ill.

Filed Feb. 27, 1984, Ser. No. 584,190

Int. Cl.[4] B60K *20/08;* **B62D** *25/14;* **A47B** *88/00*

U.S. Cl. 180—90 **4 Claims**



1. In combination with a vehicle control console including an upwardly and rearwardly facing instrument panel having a plurality of instruments mounted therein, an instrument panel cover assembly comprising: an open mounting frame secured to the panel in surrounding relationship to said instruments; said frame including a pair of laterally spaced projections extending above an upper margin of said console; a cover shaped complementary to the frame and having peripheral flange means for overlapping the frame when the cover is in an operative position blocking access to said instruments; said cover including a pair of spaced parallel ribs integral with a bottom surface thereof and extending in a direction from top to bottom of the cover; said pair of ribs each containing an elongate opening therein extending the length thereof and having upper ends projecting beyond an uppermost portion of said flange means when the cover is in its operative position; pin means received through said laterally spaced projections and through each elongate opening and thereby shiftably and pivotably mounting said cover to said frame; a key operable lock mounted to a portion of said cover opposite from the projecting ends of said ribs and including a revolvable tang; a locking tab formed integrally with a lower portion of said frame and being spaced above said panel for permitting the tang to be rotated therebeneath when the cover is in its operative position; and said ribs being located relative to said projections of the frame for permitting the cover to be, once unlocked, pivoted about said pin means and slid to a stored position on top of said console.

4,549,626

ARRANGEMENT IN AIR CUSHION VEHICLES

Seppo Korppoo, Espoo, and Henry Hänel, Helsinki, both of Finland, assignors to Oy Wärtsilä Ab, Helsinki, Finland

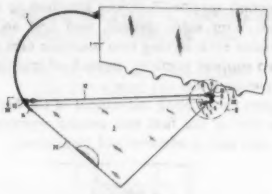
Filed Aug. 23, 1983, Ser. No. 525,658

Claims priority, application Finland, Aug. 26, 1982, 822958

Int. Cl.[4] B60V *1/16*

U.S. Cl. 180—127 **17 Claims**

1. An arrangement for the attachment of a lower portion of a skirt forming an air cushion limiting member in an air cushion vehicle, said arrangement comprising attachment points inside said shirt, said attachment points having an attachment eye or the like, through which a pulling element is drawn, said pulling element having an inner end attached to said lower skirt portion and, following said pulling element, at the opposite side of said attachment eye or the like, an outer end attached to a point



where the attachment is operable from the outside of said air cushion vehicle.

4,549,627

POWER STEERING APPARATUS

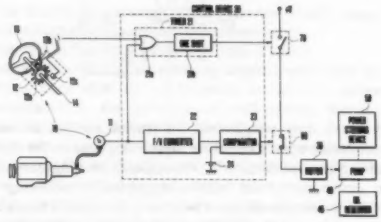
Sadao Takeshima, and Takeshi Ohe, both of Higashimatsuyama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Jun. 21, 1983, Ser. No. 506,302

Claims priority, application Japan, Jun. 25, 1982, 57-108319

Int. Cl.[4] B62D *5/06*

U.S. Cl. 180—142 **12 Claims**



12. A power steering apparatus comprising a power steering device, an oil pump for actuating the power steering device, a sensor device for detecting the running state of a motor car, a control device for controlling said pump in accordance with an output of said sensor device, said control device driving said pump when said sensor device detects the car speed is lower than a predetermined value and stops said pump when said sensor device detects that said car is at a standstill and the steering wheel of the motor car is not being rotated, wherein said pump is driven by a motor to which a voltage source is connected through a switch means controlled by said control device, wherein said control device comprises an F/V converter for converting a signal of the car speed from said sensor device into a DC voltage, a first comparator for comparing the DC voltage with the predetermined value, a second comparator for comparing the DC voltage with another predetermined value which is an extremely low speed below the former predetermined value, an OR gate circuit for receiving the steering signal and an output of said second comparator, and an exclusive-OR gate circuit for receiving outputs of said OR gate circuit and said first comparator to produce a control signal which controls ON/OFF operation of said switch.

4,549,628

POWER STEERING DEVICE

Michio Abe, Kasugai; Naoyuki Maeda, Inuyama, and Shigemitsu Tokunaga, Kasugai, all of Japan, assignors to Toki TRW & Co., Ltd., Kasugai, Japan

Filed Mar. 28, 1983, Ser. No. 481,145

Claims priority, application Japan, Apr. 14, 1982, 57-61104

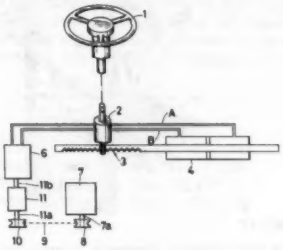
The portion of the term of this patent subsequent to Jul. 3, 2001, has been disclaimed.

Int. Cl.[4] B62D *5/06*

U.S. Cl. 180—143 **10 Claims**

1. A power steering device of an automotive vehicle, comprising:

an engine of the vehicle;
a steering pump driven by the engine;
an actuator;
a control valve connected to both the steering pump and the actuator for controlling the amount and direction of power fluid supplied from the steering pump into the actuator in response to the steering operation of the steering wheel;
a centrifugal clutch having an input shaft and an output shaft for receiving the power from the engine at the input shaft and transmitting the power to the steering pump from the output shaft when the vehicle speed is low or zero; and



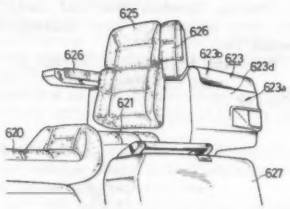
spring means for causing the centrifugal clutch to cut off the power transmission from the input shaft to the output shaft when the vehicle speed is so high that the centrifugal force of the centrifugal clutch is larger than the biasing force of the spring means.

4,549,629

REAR SEAT DEVICE FOR TWO-WHEELED MOTOR VEHICLES

Katsusuke Komuro, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 20, 1983, Ser. No. 515,567
Claims priority, application Japan, Jul. 20, 1982, 57-126099
Int. Cl.[4] B62D *61/02;* **A47C** *7/54*
U.S. Cl. 180—219 **17 Claims**



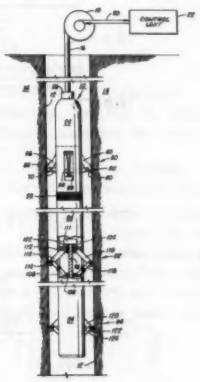
10. A rear seat device, for a two-wheeled motor vehicle having a front seat and a rear seat both mounted on a frame, comprising:
a carrier bag fixed to said frame;
a back rest comprising a part of said carrier bag, the width of said back rest being substantially equal to the width of said rear seat and substantially less than the lateral dimension of said carrier bag; and
foldable arm rest means on at least one of right and left sides of said back rest and including an arm rest having a cushion on at least one surface thereof, said arm rest having a substantially horizontal posture with said cushion facing upward when in use and having a substantially upright posture at a side of said back rest with said cushion facing forward when folded, whereby said folded arm rest provides additional back rest area.

4,549,630

CONTINUOUS SHEAR WAVE LOGGING APPARATUS

Graydon L. Brown, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Mar. 21, 1983, Ser. No. 477,641
Int. Cl.[4] G01V *1/16, 1/40, 1/053*
U.S. Cl. 181—106 **8 Claims**



1. Sonde apparatus for continuous shear wave logging of a borehole, comprising:
frame means;
means supporting said frame means for selected continual movement along said borehole;
plural coupling arms retractably secured in said frame means, each coupling arm having an upper end and a lower end with a knife edge coupling surface for engagement with the borehole wall;
means for actuating the plural coupling arm lower end knife edge coupling surface into torsionally rigid contact with the borehole; said means maintaining said coupling surfaces in torsionally rigid contact with the borehole as said support means moves said frame means along said borehole;
means connecting the coupling arm upper ends and lower ends for concerted rotary movement; and
rotary actuator means secured to said frame means for imparting rotary impulse movement through said means connecting to rotate said lower end coupling surfaces thereby to torque the periphery of the borehole and generate torsional shear wave energy in the adjoining erth formation.

4,549,631

MULTIPLE PORTING LOUDSPEAKER SYSTEMS

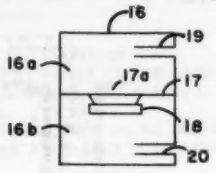
Amar G. Bose, Wayland, Mass., assignor to Bose Corporation, Framingham, Mass.

Filed Oct. 24, 1983, Ser. No. 544,466
Int. Cl.[4] H05K *5/00*
U.S. Cl. 181—155 **7 Claims**

1. An improved ported loudspeaker system comprising,
electroacoustical transducing means having a vibratible cone,
enclosure means for supporting said electroacoustical transducing means for converting an input electrical signal into a corresponding acoustic output signal, dividing means coacting with said electroacoustical transducing means for dividing the interior of said enclosure means into first and second subchambers with a first surface of said electroacoustical transducing means contacting said first subchamber and a second surface of said electroacoustical transducing means contacting said second subchamber,
first and second passive radiating means each characterized

by acoustic mass for coupling said first and second subchambers respectively to the region outside said enclosure means,

said first subchamber and said first passive radiating means configured for establishing a first resonance at a first bass



frequency for minimizing excursion of said cone at said first bass frequency,

and said second subchamber and said second passive radiating means configured for establishing a second resonance at a second bass frequency for minimizing excursion of said cone at said second bass frequency.

4,549,632

LADDER

Shunsaku Inoue, Ikeda, Japan, assignor to Alinco Incorporated, Takatsuki, Japan

Filed Dec. 30, 1983, Ser. No. 566,948
Int. Cl.[4] E06C *1/383*
U.S. Cl. 182—23 **1 Claim**

1. A ladder comprising a main ladder and a subordinate ladder having hinge plates attached to the upper end of each of the main and subordinate ladders, said ladders each having a pair of stanchions joined by a plurality of rungs, and supporting arm levers, wherein

(a) each rung is pivotably and turnably mounted to both stanchions;

(b) said supporting arm levers each with one end pivotably and turnably mounted to a stanchion and the other free end of each coaxially detachably mounted directly to the central region of a rung;

(c) the lower end of each stanchion being curvedly formed in a widening form below the lowest rung between the stanchions;

(d) half the width of each hinge plate is fixed to the upper end portion of the main ladder and the other half of the width of each hinge plate is pivotably and turnably mounted to the upper end portion of the subordinate ladder which is slightly shorter than the main ladder and;

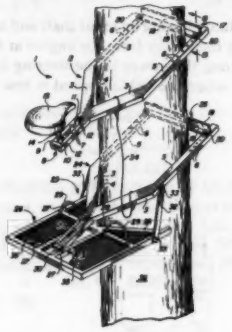
(e) said locking means ranging over said hinge plates and the subordinate ladder automatically locks the subordinate ladder into the hinge plates when the subordinate ladder is turned and extended linearly with respect to the main ladder.

4,549,633

TREE CLIMBING APPARATUS

Horace L. Merritt, Rte. 1, Box 24, Cotton Valley, La. 71078

Filed Oct. 25, 1984, Ser. No. 664,546
Int. Cl.[4] A01M *31/02*
U.S. Cl. 182—135 **20 Claims**



1. A tree climbing apparatus comprising:

(a) a climbing platform characterized by a platform blade for transversely engaging a tree; a platform yoke having elongated seat support means at one end, a pair of platform Y-segments diverging in angular relationship from one end of said seat support means for engaging the tree at a point opposite said platform blade and a pair of platform legs extending in parallel relationship from said Y-segments, respectively, said platform legs spanning the tree and the extending ends of said platform legs removably connected to opposite ends of said platform blades; and

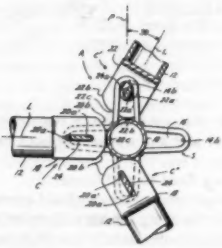
(b) foot support means engaging the tree beneath said platform blade and said platform yoke for supporting a person.

4,549,634

SCAFFOLD CONNECTOR ASSEMBLY

Charles W. Duncan, Houston, Tex., and David G. Murray, Cleveland, Ohio, assignors to Waco International Corporation, Houston, Tex.

Filed Apr. 15, 1983, Ser. No. 485,307
Int. Cl.[4] E04G *7/30*
U.S. Cl. 182—179 **8 Claims**



1. A scaffold connector assembly for connecting upright member to a cross member to form a scaffolding structure comprising:

a socket mounted with the upright member, said socket having an elongated opening substantially parallel to the axis of the upright member adapted for locking engagement;

a connector having an opening adapted to mount with said socket;

said connector includes a yoke mounted with the cross member;

a wedge adapted to be mounted in said connector opening and positioned in said socket for locking said connector in selected positions relative to said socket and upright member; and

said yoke having a first abutment surface adapted to resistively engage the upright member so as to securely and selectively lock said connector to said socket in a position perpendicular to the upright member and a second abutment surface adapted to resistively engage the upright member so as to securely and selectively lock said connector to said socket at an angle up to about 30° from the position perpendicular to the upright member when said wedge is mounted in said connector opening and said socket.

4,549,635

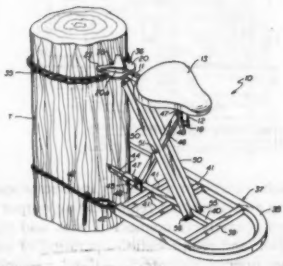
PORTABLE FOLDING HUNTING STAND

Victor Early, P.O. Box 42, New Waverly, Tex. 77358

Filed Mar. 18, 1985, Ser. No. 712,427

Int. Cl.⁴ A01M *31/02*; A45F *3/26*; A47C *9/10*

U.S. Cl. 182—187 **11 Claims**



1. A portable hunting stand foldable from a collapsed transporting position to an erected position attachable to a vertically extending object comprising;

a rigid platform member,

an seat support member movably connected to said platform member and releasably secured in a position substantially parallel thereto in an erected position,

one end of said seat support member being operable to abut the side of said vertically extending object for attachment thereto,

a seat member rotatably mounted on said support member,

a center brace member hinged to said seat support member and hinged to said platform member,

a pair of parallel brace members spaced one on each side of said center brace member and pivotally connected thereto,

said parallel brace members being releasably secured at one end to said seat support member and at the other end to said platform member,

said center brace member being movable to a position paralleling said platform,

said pair of parallel brace members being movable to a position straddling said center brace member and parallel thereto,

said seat support means being movable to a position paralleling said center brace member when said stand is in the collapsed transporting position,

attaching means on said seat support member adapted to be looped around said vertically extending member and releasably and adjustably secured by its other end to said seat support member for attaching said stand to said vertically extending object, and

locking means on said platform for releasably securing said platform, said brace members, and said seat support member in an extended or retracted position.

4,549,636

DISC BRAKES FOR VEHICLES

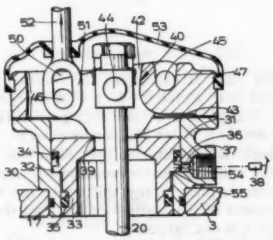
Anthony G. Price, Birmingham, and Roy E. Edwards, West Midlands, both of England, assignors to Lucas Industries public limited company, England

Filed Oct. 31, 1983, Ser. No. 546,863

Claims priority, application United Kingdom, Nov. 6, 1982, 8231769

Int. Cl.⁴ F16D *55/18*

U.S. Cl. 188—71.4 **8 Claims**



1. A disc brake for a vehicle comprising a stationary housing, a braking surface in said housing, a disc rotatable in said housing and movable into engagement with said braking surface, actuating means in said housing for moving said disc into engagement with said surface to apply the brake, said actuating means comprising at least one pressure plate located in said housing adjacent to said disc, a reaction member, recesses in adjacent faces of the pressure plate and said reaction member, and balls housed in said recesses, actuating movement of said pressure plate relative to said reaction member in the plane of said pressure plate being accompanied by axial movement of said pressure plate to urge said friction disc into engagement with the braking surface, an actuator for effecting actuating movement of said pressure plate, said actuator comprising an hydraulic cylinder and piston assembly of which the axis is substantially normal to that of said brake and of which one component is fixed relative to said housing and the other is movable, a pull-rod, a rocking thrust coupling through which said movable component acts on said pull-rod, said pull-rod passing through said cylinder and piston assembly with a substantial clearance, and said pull-rod being adapted for connection to a manually-operable brake applying device, a lever having first and second opposite ends, and a transmission member for connection to said manually-operable brake-applying devices, wherein said rocking thrust coupling is provided at an intermediate point in the length of said lever, a first pivotal connection is provided between said pull-rod and an intermediate point in the length of said lever, a second pivotal connection is provided between said first end of said lever and said stationary housing, and a third pivotal connection is provided between said second end of said lever and said transmission member, said second and third pivotal connections include lost-motion couplings so constructed and arranged that movement of said lever when the brake is applied hydraulically is not transmitted to said manually-operable brake-applying device.

4,549,637

GEAR SHIFT ARRANGEMENT FOR A VEHICLE

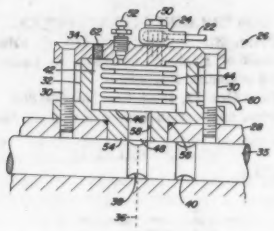
Volker Hückler, Rødolfzell; Eugen Sonns, Heddesheim; Helmut Schäfer, Ketsch, and Dieter Nobis, Mannheim, all of Fed. Rep. of Germany, assignors to Deere & Company, Moline, Ill.

Filed Aug. 19, 1982, Ser. No. 409,478

Claims priority, application European Pat. Off., Aug. 26, 1981, 81303909.6

Int. Cl.[4] G05G *5/10;* B60K *41/22*

U.S. Cl. 192—3.63 13 Claims



1. A gear shift arrangement for a vehicle with a main change-speed gear, a clutch which is disengaged when a gear change is effected, and a load shift gear which is operable while the vehicle is under load, comprising:

an interlock device between the clutch and the load shift gear, the interlock device continuously engaging the load shift gear to prevent any shifting of the load shift gear independent of the position of the load shift gear, when the clutch is disengaged.

4,549,638

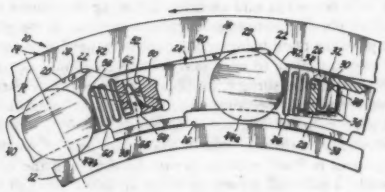
ROLLER CLUTCH ADJUSTABLE FORCE SPRING MOUNT

Albert D. Johnston, Huron, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 10, 1983, Ser. No. 521,676

Int. Cl.[4] F16D *41/06*

U.S. Cl. 192—45 2 Claims



1. In a one-way clutch of the type allowing an over-running member to freely rotate in one direction relative to another member concentric thereto while preventing relative rotation in the opposite direction, and in which a series of rollers are held in a cage mounted to the over-running member, the rollers being movable toward a ready position of touching engagement between cam ramps on the over-running member inclined in one direction relative to a radial line of the concentric members and a cylindrical surface on the other member to respond to a change in the direction of relative rotation between the members, said clutch having energizing springs for biasing the rollers toward ready position,

an improved means for adjusting the biasing force of at least some of the springs, comprising,

means responsive to the centrifugal force of the rotating over-running member providing an increased biasing force on the springs to counteract the effect of the over-running member induced centrifugal force on the rollers and to maintain the rollers in their ready position for quick response to a change in direction of relative rotation between the members, thus allowing the over-running member to rotate at higher speeds normally tending to cause the rollers to move out of ready position.

4,549,639

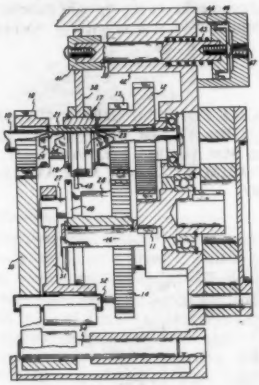
CLUTCH CONTROL FOR A ROTATION AND RECIPROCATION TRANSMISSION

Quinten A. Hansen, 4338 Hwy. 38, Franksville, Wis. 53126

Filed Feb. 6, 1984, Ser. No. 577,183

Int. Cl.[4] F16D *21/02*

U.S. Cl. 192—48.91 11 Claims



1. In a clutch control for a rotation and reciprocation transmission having a rotating and reciprocating output shaft, two drive members operatively connected with said shaft for respective rotation and reciprocation operation of said shaft, a clutch member operatively interposed and movable between said drive members for alternate drive connection with said drive members and being drivingly connected with said shaft to alternately transmit rotation and reciprocation to said shaft in accordance with the operation of said drive members, a yieldably urged movable clutch shifter operatively connected with said clutch member between its positions of drive connection with said drive members, the improvement comprising a gate operatively interposed between one of said two drive members and said clutch shifter and disposed in the path of said clutch shifter to alternately release and restrain said clutch shifter relative to said clutch shifter movement of shifting said clutch member toward one of said two drive members.

4,549,640

OPERATION SYSTEM FOR HOISTING DEVICE

Syoichi Sekino, Ibaraki, Japan, assignor to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

Filed Jan. 25, 1983, Ser. No. 460,803

Claims priority, application Japan, Jan. 28, 1982, 57-10906; Jan. 28, 1982, 57-10907; Jan. 28, 1982, 57-10908; Jan. 28, 1982, 57-10909; Jan. 28, 1982, 57-10910; Jan. 28, 1982, 57-10911

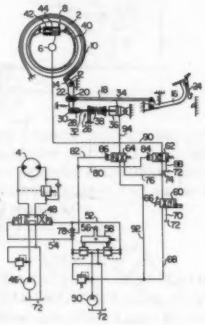
Int. Cl.[4] B60K *41/28, 41/24*

U.S. Cl. 192—0.094 15 Claims

1. An operation system for a hoisting device comprising, in combination: a hoisting device; a hydraulic motor for driving the hoisting device; a hydraulic fluid source; a reservoir; clutch means for connecting and disconnecting said hydraulic motor and said hoisting device, said clutch means including clutch cylinder means and spring means operative such that when the clutch cylinder means is in commuication with the reservoir, the spring means performs one of clutch connection and clutch disconnection, and when the clutch cylinder means is in com-

munication with the hydraulic fluid source, the clutch cylinder means performs the other of clutch connection and clutch disconnection with a hydraulic fluid supplied from the hydraulic fluid source; foot brake means for applying a brake to the hoisting device by the control of an operator, and automatic brake means for applying an automatic brake to the hoisting device, said automatic brake means including brake cylinder means and spring means operative such that when the brake cylinder means is in communication with the reservoir, the spring means applies the brake, and when the brake cylinder means is in communication with the hydraulic fluid source, the brake cylinder means releases the brake with a hydraulic fluid supplied from the hydraulic fluid source; wherein said operation system further comprises:

(a) first, second and third directional control valve means each having a first position and a second position, said first, second and third valve means being connected between the hydraulic fluid source and reservoir and the clutch and brake cylinder means to operate such that only



when the first and second valve means are both in the first position, the clutch cylinder means is brought into communication with one of the hydraulic fluid source and the reservoir which serves for the clutch disconnection thereby to cause the clutch means to be disconnected, and only when the first valve means is in the second position and the third valve means is in the first position, the brake cylinder means is brought into communication with the reservoir to cause the automatic brake means to apply the brake; and

(b) first, second and third operation means for operating the first, second and third directional control valve means respectively;

(c) the second and third operation means being operative in response to inoperation and operation of the hydraulic motor in such a manner that when the hydraulic motor is inoperative, the second and third valve means are in the first position, and when the hydraulic motor is operative, the second and third valve means are in the second position.

4,549,641

CLUTCH DISC

Hisao Ootani, and Satoru Maruyamano, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

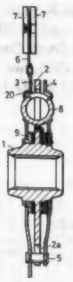
Filed Aug. 6, 1982, Ser. No. 406,012

Claims priority, application Japan, Oct. 6, 1981, 56-149064[U]

Int. Cl.⁴ F16D *3/14, 3/66*

U.S. Cl. 192—106.2 **3 Claims**

1. In a clutch disc having a circular hub, a circular hub flange fixed on the outer periphery of said hub, a disc plate disposed on one side of said flange, a subdisc plate disposed on the other side of said flange, said disc plate being connected to said subdisc plate by stopper pins at the outer peripheral portions thereof, and said disc plate and said subdisc plate determining a play angle A; an improvement comprising a first frictional plate connected to said subdisc plate so as to rotate therewith, a thrust plate disposed between saib hub flange and said first frictional plate and connected to saib hub flange so as to rotate up to a play angle B relative thereto, said play angle



A being larger than said play angle B, an elastic means disposed between said first frictional plate and said subdisc plate for pressing said first frictional plate toward said thrust plate, and a second frictional plate attached to said thrust plate on the hub flange side, said second frictional plate having a smaller frictional coefficient than said first frictional plate.

4,549,642

TORSION DAMPERS

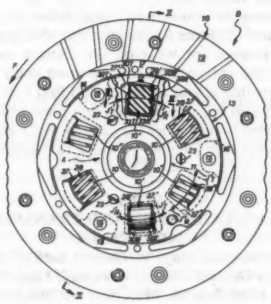
Pierre Loizeau, Ville D'Avray, France, assignor to Valeo, Paris, France

Filed Feb. 8, 1983, Ser. No. 464,934

Claims priority, application France, Feb. 9, 1982, 82 02034

Int. Cl.⁴ F16D *3/66, 3/68*

U.S. Cl. 192—106.2 **17 Claims**



1. A torsional damper comprising at least two coaxial parts mounted so as to be rotatable relative to one another within predetermined limits of relative angular movement, a plurality of elastic members extending in a substantially tangential direction relative to a circumference of the damper and disposed between said coaxial parts in a circumferential direction, at least one of said elastic members comprising a block of elastic material partially housed, without circumferential clearance in a rest configuration of the damper, in an opening formed for this purpose in a first of said coaxial parts, and partially housed, with circumferential clearance in said rest configuration and for at least a first circumferential direction, in an opening formed for this purpose in a second of said coaxial parts, wherein said elastic material block has at least one elastic material peg projecting therefrom in said first circumferential

direction, said peg defining a damping stage operative after a predetermined relative angular displacement of said coaxial parts, the rest of said elastic material block defining a further damping stage operative upon further relative angular displacement of said coaxial parts.

4,549,643

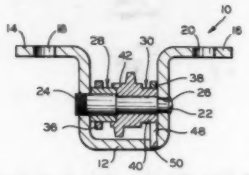
SELF ADJUSTING DEVICE FOR A FRICTION CLUTCH

Richard A. Flotow, Butler, and William M. Tennant, Auburn, both of Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Sep. 26, 1983, Ser. No. 535,598

Int. Cl.[4] F16D *13/75*

U.S. Cl. 192—111 A **11 Claims**



1. A self adjusting device adapted to engage an actuating means and a movable adjusting means in a friction clutch so as to compensate for wear on friction surfaces of the clutch, the device comprising:

a mounting bracket adapted to be secured to the clutch, said mounting bracket including a central U-shaped portion and a flange portion formed at the end of each of the legs of said central U-shaped portion;

first and second rotatable hub members rotatably supported by said legs of said central U-shaped portion and a lost motion coupling connection therebetween;

a coil spring for rotating said first hub member upon being actuated, said coil spring connected to and acutated by the actuating means; and

means formed on said second hub member and connected to the adjusting means for moving the adjusting means so as to compensate for wear on the friction surfaces of the clutch, said coil spring being actuated upon movement of said actuating means to rotate said first hub member and, through said lost motion coupling connection, to actuate said second hub member for causing said means formed on said second hub member to move said adjusting means.

4,549,644

ARTICLE ACCUMULATOR AND TRANSFER SYSTEM AND METHOD

Patrick J. Bowles, and Lloyd W. Garrett, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Jun. 15, 1983, Ser. No. 504,461

Int. Cl.[4] B65G *43/00*

U.S. Cl. 198—341 **26 Claims**

1. A method of combining the transfer of articles from a loading station to an unloading station and the accumulation of articles to avoid prolonged interrupted operation of the unloading station in the event the loading station is inoperative comprising:

a first primary operation including:

(a) intermittently moving and stopping a continuous conveyor having a plurality of article stations between the loading and unloading stations,

(b) placing articles on the conveyor at the loading station when the conveyor is stopped and there is no article on the conveyor at the loading station at a rate greater than the rate at which the articles are removed at the unloading station,

(c) removing articles from non-sequential article stations of the conveyor when at the unloading station and the conveyor is stopped, and

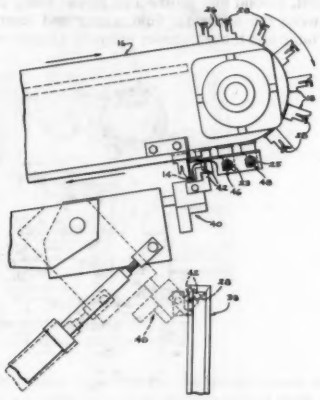
a secondary operation in the event the loading station is inoperative including:

(a) intermittently moving and stopping the continuous conveyor between the loading and unloading stations,

(b) sensing each time the conveyor stops the presence or absence of articles at the unloading station and at the first preceding article station before the unloading station and sending a corresponding signal to a electronic control device,

(c) selecting as a function of the signals:

(i) moving the conveyor to bring the next preceding article station to the unloading station when an article is absent at the unloading station, and



(ii) selecting when an article is at the unloading station which one as between the article station at the unloading station and first immediately preceding article station thereto the article to be unloaded from the article station when at the unloading station based on the logic of selecting the article at the unloading station when there is an article at the unloading station and no article at the first preceding article station and selecting the article of the first preceding station when there is an article at the unloading station and the first preceding article station, and

(d) removing the selected article when at the unloading station.

4,549,645

FEEDING ARTICLES

Barry G. Applegate, London, England, assignor to Molins plc, London, England

Filed Oct. 31, 1983, Ser. No. 547,287

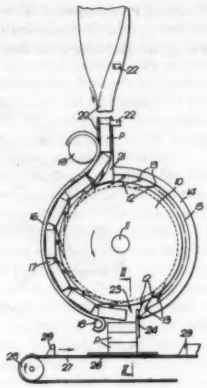
Claims priority, application United Kingdom, Nov. 11, 1982, 8232164

Int. Cl.[4] B65G *29/02, 47/24*

U.S. Cl. 198—408 **13 Claims**

1. Apparatus for feeding flat articles, such as cigarette packets, having two major axes parallel to their flat faces, comprising a wheel mounted for rotation about a substantially horizontal axis; driving means for continuously rotating the wheel in a predetermined direction; resilient means formed on the periphery of the wheel for engaging the articles, said resilient means comprising a plurality of equi-spaced resilient arms which in use extend backwards relative to the direction of rotation of the wheel, each arm being provided at its free end with a rounded enlargement which is engageable with the rear of a respective article and can slidably release said article when movement of said article is restrained; an upright inlet chute

for leading the articles to the wheel in an orientation parallel to one of said major axes; a short substantially vertical outlet extending radially of the wheel for receiving the articles from the wheel in a direction perpendicular to said two major axes;



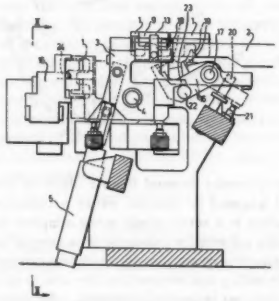
passage means defining a substantially arcuate passage around the wheel between said inlet chute and said outlet; and horizontal conveyor means mounted beneath the outlet for removing the lowermost articles at least one at a time in a direction parallel to one of said major axes.

4,549,646

DEVICE FOR SEPARATION, ORIENTATION, AND POSITIONING OF PARTS GENERALLY FLAT IN SHAPE

Patrick Le Tiec, Meudon, and Marc Lacroix, Viroflay, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Jun. 7, 1982, Ser. No. 385,828
Claims priority, application France, Jun. 10, 1981, 81 11435
Int. Cl.⁴ B65G *47/24*
U.S. Cl. 198—409 **3 Claims**



1. A device for separation, orientation, and positioning of a plurality of parts essentially flat in their general shape, which receives said parts distributed onto a storage rail in a continuous line by an auxiliary device and transfers the parts one by one into exact orientation and position, for being gripped by a part-holder, wherein the parts are supplied in flat position upon said storage rail, said device comprising:

a piston;

tilting means operatively connected to said piston so as to be activated by said piston between an initial, raised position and a second, tilted position, wherein said tilting means further comprises a support forming a continuation of said storage rail in the raised position of the tilting means so as to receive a first part of said plurality of parts, and first stop means for arresting said first part wherein said support further comprises retaining means for preventing one of said plurality of parts situated on said tilting means from becoming dislodged from said tilting means when said tilting means is tilted;

second stop means operably connected to said tilting means and which further comprises a tilting element, a return spring biasing said tilting element in a predetermined direction, and at least one stop pad mounted on said tilting element in an active position for stopping a second part of said plurality of parts on said storage rail upon tilting of said tilting means; and

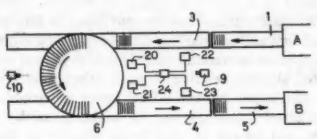
means for disengaging said at least one stop pad from said active position when said tilting means is positioned in said initial, raised position, wherein said retaining means is slidably mounted horizontally and parallel to said support and which further comprises first and second fingers disposed so as to permit said second part of said plurality of parts to pass under said first and second fingers and means for causing movement of said first and second fingers from an initial position covering said first part to a second position releasing said first part and allowing removal of said first part by said part-holder.

4,549,647

APPARATUS FOR THE TRANSFER OF ARTICLES BETWEEN TWO MACHINES

Lionel Cossé, Nantes, France, assignor to Biscuiterie Nantaise-BN, Nantes, France

Filed Aug. 17, 1982, Ser. No. 408,928
Claims priority, application France, Apr. 2, 1982, 82 06004
Int. Cl.⁴ B65G *47/26*
U.S. Cl. 198—461 **6 Claims**



1. An apparatus for transferring solid articles of identical size and shape without changing their position or spacing relative to each other, the articles being discharged from an upstream machine at a first constant speed to a downstream machine having a second speed which can differ from said first speed, said apparatus comprising a first linear endless conveyor arranged approximately horizontally and driven in the same direction and at the same speed as an inlet conveyor fed by the upstream machine, a second linear endless conveyor driven by variable speed means arranged approximately horizontal and parallel to and in substantially the same plane as the first linear conveyor, said second linear conveyor being driven in the same direction and at the same speed as an outlet conveyor feeding the downstream machine, the first and second linear conveyors being driven for translation in opposite directions, interchange means for bringing said first and second linear conveyors into communication with each other, said interchange means lying close to the same plane as the said first and second linear conveyors, said first and second linear conveyors extending substantially tangentially to said interchange means, said interchange means defining an axis of rotation extending perpendicular to said plane, said interchange means being mounted for translatory movement parallel to said first and second linear conveyors, and controlled by the relationship in speeds between said first and second linear conveyors, said interchange means being driven at a translatory speed equal to one-half the difference between the displacement speeds of said first and second conveyors, and said interchange means being

rotationally driven at a speed such that the tangential speed of the articles conveyed by said interchange means is equal to one-half the sum of the displacement speeds of said first and second conveyors.

4,549,648

BUCKET-WHEEL LOADER FOR BULK MATERIAL PILES

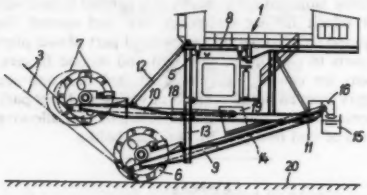
Alexander Langner, Duisburg, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Feb. 15, 1983, Ser. No. 467,359

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1982, 3207751

Int. Cl.⁴ B65G *65/02*

U.S. Cl. 198—509 **2 Claims**



1. A bridging loader being intended for use on piles of bulk material, with bucket wheels being movable along the front of such a pile of bulk material; the improvement comprising at least two bucket wheels each mounted on a boom, with the axes of rotation of said bucket wheels being disposed one above the other, the first and second bucket wheels being rotatable in a common plane of rotation extending at least approximately transverse to said front of said pile said booms of said first and second bucket wheels being mounted by means of a common horizontal shaft means to permit said booms to be pivoted slightly relative to each other, said boom associated with the upper bucket wheel being a variable-length boom constructed telescopically to make possible adjustment in height and length of said boom relative to the pile of bulk material and the lower bucket wheel, and means for conveying material from said first and second bucket wheels to be combined for discharge together therefrom.

4,549,649

UNITARY ARMED SUTURE MOUNTING BOARD

Constance E. Roshdy, North Brunswick, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Continuation-in-part of Ser. No. 555,724, Nov. 28, 1983,. This application Sep. 4, 1984, Ser. No. 646,727

Int. Cl.⁴ A61B *17/06*

U.S. Cl. 206—63.3 **7 Claims**

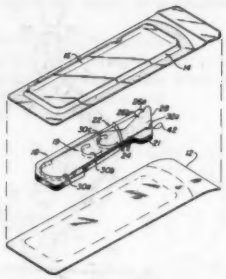
1. An element for holding a needled suture, said suture comprising a suture strand having at least one end attached to a needle and having a first portion of said strand remote from the end attached to said needle and a second portion of said strand intermediate said first portion and the end attached to said needle, said element comprising a unitary piece of soft flexible polymeric foam, said element having a longitudinal medial axis, a peripheral wall, first and second sides and first and second ends, said element further comprising:

(a) a first peripheral wall portion of said first side a first predetermined distance away from said longitudinal medial axis;

(b) a second peripheral wall portion of said first side at or near said first end, said second peripheral wall portion being a second predetermined distance from said longitudinal medial axis that is less than said first predetermined distance away from said longitudinal medial axis, said second peripheral portion thereby comprising a cut out portion of said first side;

(c) a first retaining means for retaining said needle, said first retaining means being in said second peripheral wall portion;

(d) a second retaining means spaced from said first retaining means for retaining said first portion of said strand, said second retaining means being at or near said first end; and



(e) securing means remote from said first and second retaining means for frictionally engaging said second portion of said suture strand when said strand is extended relatively tautly from said first retaining means to said securing means to said second retaining means, said securing means being within the body of said element.

4,549,650

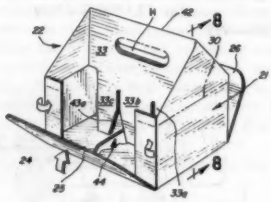
ARTICLE CARRIER

Charles L. Champlin, Rittman, Ohio, assignor to Packaging Corporation of America, Evanston, Ill.

Filed Jan. 12, 1984, Ser. No. 570,170

Int. Cl.⁴ B65D *77/04*

U.S. Cl. 206—179 **11 Claims**



1. An article carrier formed from a blank of foldable sheet material and adapted to assume either a collapsed or setup mode, and when in a setup mode being adapted to accommodate a plurality of articles arranged in a pair of substantially parallel, coextensive rows, said setup carrier comprising a base panel for subtending and supporting the article rows; a pair of end panels arranged in spaced, opposed, substantially parallel, upright relation for disposition adjacent opposite ends of the article rows, said end panels being foldably connected to opposed first peripheral portions of said base panel, the upper portion of each end panel including a tapered center segment having an upwardly extending, centrally located apex, and a pair of substantially triangular shoulder segments foldably connected to tapering sides of said center segment defining said apex, each shoulder segment having an upwardly extending apex contiguous to said center segment apex; a pair of side panels arranged in substantially parallel, upright relation for disposition adjacent corresponding article rows, said side panels being foldably connected to remaining peripheral portions of said base panel and being connected to said end panels and

coacting therewith to delimit the periphery of said base panel and to form an open top chamber; and a hand-gripping unit spanning the distance between said upright end panels and being foldably connected thereto, said hand-gripping unit including a pair of elongated upright panel sections arranged in substantially face-to-face parallel relation throughout and forming a thin partition of substantially uniform thickness and having a lower peripheral portion proximate said base panel, said partition being disposed substantially perpendicular to said base panel and spanning the distance between said end panels and coacting with said end and side panels to form the open top chamber into a pair of contiguous elongated compartments arranged in side by side relation, each compartment being adapted to accommodate a row of articles.

9. A blank of foldable sheet material for forming a basket-type article carrier adapted to accommodate a plurality of articles arranged in a pair of substantially parallel, coextensive rows, said blank comprising a base panel for subtending and supporting the rows of articles; side panels foldably connected to opposed first peripheral segments of said base panel; a first end panel having a lower edge foldably connected to a second peripheral segment of said base panel, said second segment being substantially transverse to said first segments; a hand-gripping unit foldably connected to an upper edge of said first end panel; and a second end panel having an upper edge foldably connected to an edge of said hand gripping unit opposite said first end panel; each end panel being of substantially like configuration and having an upper section including a substantially triangular center segment with an apex thereof adjacent said hand-gripping unit, and a pair of substantially triangular shoulder segments having corresponding first sides thereof foldably connected to sides of said center segment defining said apex, each shoulder segment having an apex contiguous to the apex of the center segment to which said shoulder segment is connected; said hand-gripping unit including a pair of panel sections having corresponding upper edges thereof connected by a common foldline, opposite ends of the common foldline terminating at the corresponding apexes of the center and shoulder segments of said end panels, opposed side edges of each panel section being foldably connected to corresponding second sides of the shoulder segments of said end panels, the length of each folding connection between a panel section side edge and a second side of the corresponding shoulder segment being at least one half the dimension between the center segment apex and a corresponding second peripheral segment of said base panel, the first and second sides of each shoulder segment intersecting one another to form the apex contiguous to the apex of a center segment of one end panel; when said blank is set up to form said article carrier, the panel sections of said hand-gripping unit being disposed in substantially contacting face-to-face relation and defining a thin partition disposed substantially perpendicular to said base and end panels, and the shoulder segments of said end panels being disposed in face-to-face relation to the interior surface of the center segment to which they are connected.

4,549,651

CARRIER FOR PIN GRID ARRAY

James C. Alemanni, 3917 Sherbourne Dr., Oceanside, Calif. 92054

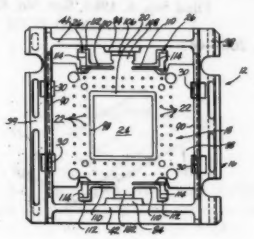
Filed Dec. 21, 1984, Ser. No. 684,847
Int. Cl.[4] B65D *73/02*
U.S. Cl. 206—329 **8 Claims**

1. A two-part carrier for a pin grid array having a body with a plurality of pins projecting from at least one face of the body, the two-piece carrier comprising:

an outer frame having rigid side walls extending around the perimeter of an open space within the frame;

a carrier insert comprising a base for supporting the body of the pin grid array, the base having an array of holes through which the pins project when the body of the pin grid array is supported on the base, and flexible retention means on opposite ends of the carrier base for engaging the body of the supported pin grid array for retaining it on the carrier insert base, said flexible retention means being bendable away from the carrier insert base for releasing engagement with the body of the supported pin grid array; and

releasable fastening means cooperating between the carrier insert base and the side walls of the frame for attaching the carrier insert base to the frame in a snap lock to support



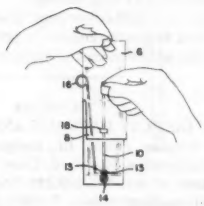
the carrier insert inside the open space within the frame with the pin grid array supported on said carrier insert, and with the frame extending around the perimeter of the carrier insert, the releasable fastening means being exposed in said snap-locked position for contact with an external force applying means to release the fastening means from the snap locked position to remove the carrier insert from the frame.

4,549,652

IUD PACKAGE

Michael J. Free, Seattle, Wash., assignor to PIACT, Seattle, Wash.

Continuation of Ser. No. 509,721, Jun. 29, 1983, abandoned.
This application Feb. 1, 1985, Ser. No. 697,502
Int. Cl.[4] B65D *85/16*
U.S. Cl. 206—363 **2 Claims**



1. A sterile package for shipping, storing and manipulating an intrauterine device under sterile conditions comprising:

a flexible sealed envelope of a size to contain an intrauterine device and including as an integral portion thereof, seal lines which totally close the envelope and further, form a section along one side of the package having a substantially flat portion facing the interior of the package interrupted by an outwardly projecting portion in communication with the interior of the package, said projecting portion including a neck adjacent to the flat portion, aid neck being of sufficient dimension to allow the passage of an insertion tube and the arms of the intrauterine device folded along the outside thereof whereby the stem of the IUD may be placed within the tube, the tube and the intrauterine device pushed into the projecting portion, folding the arms back along the tube such that the IUD may be manipulated into the projecting portion, pinched from exterior of the package and placed within the tube

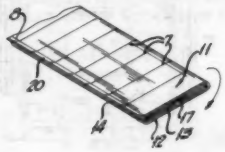
ready for placement without removing the IUD from the package or unduly exposing the IUD to contamination.

4,549,653

ADHESIVE BANDAGE AND PACKAGE

Nels J. Lauritzen, Piscataway, N.J., assignor to Johnson & Johnson Products, Inc., New Brunswick, N.J.

Filed Sep. 6, 1983, Ser. No. 529,463
Int. Cl.⁴ B65D *73/00*
U.S. Cl. 206—441 **12 Claims**



1. A packaged adhesive bandage comprising an adhesive bandage and an envelope therefor,

said bandage comprising a backing strip having side edges and end edges and having a tacky adhesive coating on one surface thereof,

said envelope comprising a cover panel and opposing base panel with side edges and end edges of said panels sealed around the periphery thereof to enclose said bandage, the backing strip of said bandage being laminated between the panels of said envelope along the side edges thereof,

a portion of said cover panel and said base panel of said envelope extending beyond the seal at one end thereof to provide pull tab means for opening said envelope,

the end of said backing strip proximal to said pull tab means being detachably secured to the base panel of said envelope,

the cover panel of said envelope including an adhesive release surface overlying the adhesive coated surface of the backing strip of said bandage,

whereby when said cover panel is separated from said package, said bandage remains in position on said base panel with the adhesive coated surface exposed.

4,549,654

ARTICLE DISPLAY PACKAGE AND BLANK THEREFOR

Randy J. Tiesman, Fulton, Ill., assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 499,216, May 31, 1983, abandoned.
This application Nov. 7, 1984, Ser. No. 668,968
Int. Cl.⁴ B65D *73/00, 5/50*
U.S. Cl. 206—486 **6 Claims**

1. An article display package for a flashlight and battery combination comprising:

(a) a paperboard front panel;

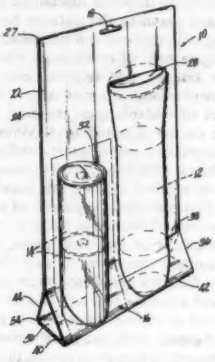
(b) a paperboard back panel foldably connected to one edge of said front panel, said back panel being juxtaposed and secured at secured portions in face to face relationship with said front panel by securing means;

(c) means forming an article receiving first opening, said article receiving opening including article encircling opening edges in said front and back panels, said opening edges being configured substantially to the shape of the article to be received in the opening to retain the article in the opening;

(d) means forming an article receiving second opening, said second opening including edges encircling an article holding blister, said blister being configured substantially to the shape of a second article;

(e) a passageway between secured portions of said front and back panels communicating said first and the full length of said second openings with each other for packing of said second opening with product;

(f) front and back lower angled panels foldably connected respectively to said front and back panels along fold lines which are parallel to the foldable connection between said front and back panels and equally spaced therefrom, said front and back lower angled panels being angled away



from one another and angularly aligned with respect to the plane of said front and back panel;

(g) said first and second openings in said front panel extending into said front lower angled panel; and,

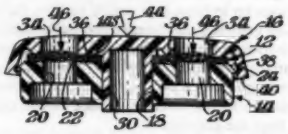
(h) said front and back lower angled panels foldably connected together having an inner bottom flap and an outer integral base to create a reinforced triangular stand.

4,549,655

CONTAINER FOR A LAYERED CHEMICAL ANALYSIS SYSTEM

Jesse G. Forsythe, Jr., Media, and Sally S. Stafford, Chadds Ford, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 5, 1983, Ser. No. 558,311
Int. Cl.⁴ C12K *1/10;* **G01N** *31/00*
U.S. Cl. 206—569 **25 Claims**



1. A container for a layered chemical analysis system of the type having a stack containing a plurality of layers of material, the stack having a plurality of test sites defined thereon, the container comprising:

a first, rigid, member;

a second, flexible, normally bowed member moveable with respect to the rigid member from a first, unstressed, position to a second, stressed, position; and

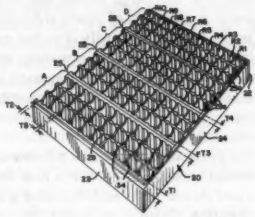
means for engaging the first and second members to define a space therebetween to contain the stack

while in the second position the flexible member being flexed and flattened with respect to the rigid member to generate a reaction force which acts with substantially equal magnitude on the layers of the stack at each test site in a direction substantially normal thereto to compress uniformly the same between the members into imtimate contact with each other.

4,549,656
PACKAGE DEVICE AND METHOD OF MANUFACTURING

Joey L. Barnes, 167 D Quincy Ct., Bloomingdale, Ill. 60108, and James K. Barnes, 143 Spring, Glen Ellyn, Ill. 60137

Filed Aug. 9, 1983, Ser. No. 521,621
Int. Cl.[4] B65D *83/00*
U.S. Cl.-206—589 13 Claims



1. A package for shipping small commodities in a shock absorbing environment to prevent damage thereto and to facilitate handling in transit, the improvement comprising;

said package being molded of expanded polystyrene plastic;

said packages having a plurality of chambers positioned end to end and adapted to receive and restrain the commodities inserted therein;

said chambers defined by internal side walls and having a depth to thereby completely encapsulate the associated commodity to fully protect the commodity from damage while in transit and to facilitate packaging;

said chambers including ribs integral with said side walls and extending the depth of said chambers and extending into the chambers at an angle whereby the ribs converge toward one another at the bottom of the chamber to provide a wedge shaped chamber in which the resilient ribs contact the commodities to hold same in place during assembly and transit; and,

said ribs being some what deformable to provide a gripping hold on an associated commodity and forming with said sidewalls a corrugated contour which provides high strength while being light weight.

4,549,657
EASILY OPENED AND RECLOSABLE BAG AND APPARATUS FOR MAKING SAME

Andrew McG. Martin, 77 Gibbs St., Suite 3, Brookline, Mass. 02146

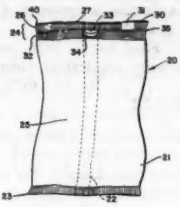
PCT No. PCT/US82/00411, § 371 Date Nov. 29, 1982, § 102(e) Date Nov. 29, 1982, PCT Pub. No. WO82/03372, PCT Pub. Date Oct. 14, 1982

Continuation-in-part of Ser. No. 251,185, Apr. 6, 1981, abandoned, which is a continuation-in-part of Ser. No. 11,080, Feb. 12, 1979, abandoned, and Ser. No. 29,886, Apr. 13, 1979, abandoned. This PCT application Apr. 2, 1982, Ser. No. 451,170
Int. Cl.[4] B65D *27/36*
U.S. Cl. 206—610 10 Claims

1. In a bag formed to enclose contents in a sealed pouch between walls of the bag and constructed with at least two seals formed by the material of the bag, the seals enclosing the bag and sealing the contents within the bag, the improvement wherein

A. the bag is formed as a flattened tube having a longitudinal seal and two end seals;

B. an unsealed portion is formed at a selected end seal for exposing separated wall portions adjacent said selected end seal thereby to facilitate gripping of the separated wall portions for breaking said selected end seal to gain access to the bag contents, said selected end seal comprising first and second contiguous portions that traverse said bag, said second portion being intermediate said first portion and the pouch, said unsealed portion being formed in said second portion coextensive with and contiguous a predetermined length of the interface between said first and second portions; and

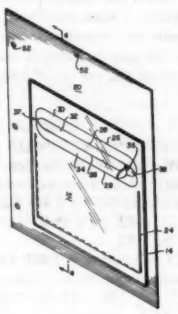


C. reclosure means are formed integrally with the bag at said selected end seal thereof for reclosing the open end of the bag after said selected end seal has been broken.

4,549,658
MINI DISK HOLDER

Nicholas Sfikas, 29 Widewaters La., Pittsford, N.Y. 14534

Filed Feb. 13, 1984, Ser. No. 579,875
Int. Cl.[4] B65D *27/32, 85/30*
U.S. Cl. 206—614 20 Claims



1. A mini disk holder, comprising:

(a) a first sheet having inner and outer surfaces;

(b) a second sheet substantially overlying said first sheet;

(c) said first and second sheets having substantial length and width;

(d) means securing said first and second sheets at generally the periphery thereof providing a pocket between said sheets;

(e) a slit disposed in said first sheet providing means for inserting an article into said pocket;

(f) adhesive means disposed over said outer surface of said first sheet permitting said outer surface to be secured to a panel; and

(g) two groove line means disposed in the outer surface of said second sheet forming two intersecting ovals having generally parallel major axes so that said ovals provide first, second and third tamper indicating tear means;

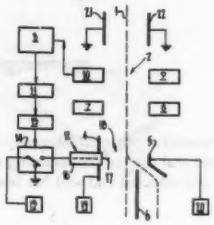
(h) each of said tamper indicating tear means removable from said second sheet for thereby providing an opening in said second sheet permitting access to said pocket and whereby unauthorized removal of any one of said tear means is thereby readily apparent.

4,549,659

PARTICLE SORTING APPARATUS UTILIZING CONTROLLABLE CORONA DISCHARGE NEEDLE

Albert P. Hawkins; Alan Boyle, and Alan M. Stone, all of Melbourne, Australia, assignors to CRA Exploration Pty. Ltd., Sydney, Australia

Filed Aug. 3, 1983, Ser. No. 520,124
Claims priority, application Australia, Aug. 4, 1982, PF5199
Int. Cl.⁴ B07C *5/10*
U.S. Cl. 209—3.2 **14 Claims**



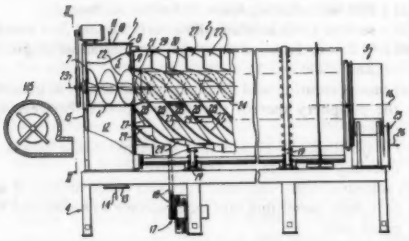
1. Sorting apparatus in which particles in a free flight trajectory path are deflected according to predetermined characteristics, wherein a particle deflection means comprises an electrostatic corona discharge means adapted to locally ionize the atmosphere through which selected particles are passing, the corona discharge means capable of being triggered to selectively charge particles having said predetermined characteristics and an electric field generator to establish an electric field effective to deflect the charge particles, the corona discharge means comprising at least one discharge needle supported in a guard electrode and wherein the amount the discharge needle projects from the guard electrode may be selectively adjusted to vary the size of the region of ionized atmosphere.

4,549,660

DRUM FOR SEPARATION OF A BULK MATERIAL

Kenneth H. Werling, Växjö, Sweden, assignor to Scandinavian Farming Aktiebolag, Hoganas, Sweden

PCT No. PCT/SE82/00159, § 371 Date Dec. 27, 1982, § 102(e) Date Dec. 27, 1982, PCT Pub. No. WO82/03963, PCT Pub. Date Nov. 25, 1982
PCT Filed May 7, 1982, Ser. No. 456,045
Claims priority, application Sweden, May 15, 1981, 8103060
Int. Cl.⁴ B07C *3/04*
U.S. Cl. 209—44.3 **9 Claims**



1. A drum separator for separating a bulk particulate material having a heavy fraction and a light fraction into a heavy fraction and a light fraction, said drum separator comprising:

a hollow, substantially cylindrical drum having a horizontally extending central axis and a front and a rear, said drum rotatable about said central axis;

means for introducing a bulk particulate material into said drum;

first discharge means, located at the rear of the drum, for discharging a heavy fraction from said drum;

second discharge means, located at the front of the drum, for discharging a light fraction from said drum;

means for passing an air flow through said drum from rear to front in a direction substantially parallel to said central axis;

in at least one horizontally extending section of said drum, between said first discharge means and said second discharge means, a plurality of rearward-feeding transport members in the form of inwardly directed spirals fastened to the inside of said drum, said inwardly directed spirals defining a plurality of thread turns located between adjacent spirals, said thread turns, upon rotation of the drum, transporting material in the thread turns toward the first discharge means;

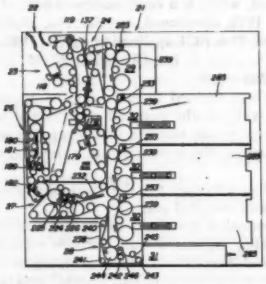
lifter means for preventing continued rearwardfeeding of all of said material in said thread turns and for raising said material in said thread turns and dropping it across said air flow upon rotation of said drum, said lifter means comprising a plurality of groups, each said group lying in a row which is oriented in an imaginary plane substantially transverse to said central axis, each of said imaginary rows intersecting at least a portion of said plurality of thread turns, at least one of said intersected thread turns containing a lifter in said row and at least one of said intersected thread turns not containing a lifter in said row, each of said groups axially spaced apart from adjacent groups, the number of thread turns containing lifters in at least the majority of said plurality of groups being such that during each rotation of the drum about said central axis at a predetermined rotational velocity, while the air flow passes through the drum at a predetermined velocity, the material raised up by said lifters and dropped down across said air flow is blown forward by said air flow, more material of the heavy fraction is generally fed to the rear through the action of the thread turns than is generally fed forward by said air flow acting on the material lifted by the lifters and forward feed of said light fraction by said air flow is generally greater than rearward feed of said light fraction in said plurality of thread turns.

4,549,661

BANK NOTE PROCESSING DEVICE

Muneki Morishita, Takatsuki; Hiroyuki Nishimura, Kameoka, and Hiroji Matsusaka, Uji, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed May 3, 1984, Ser. No. 606,466
Claims priority, application Japan, May 6, 1983, 58-79913
Int. Cl.⁴ B07C *5/02*
U.S. Cl. 209—534 **4 Claims**



1. A bank note processing device, comprising:

a money access opening in the upper part of the bank note

processing device for accepting incoming bank notes and releasing outgoing bank notes;

a bank note stacking unit below the money access opening for stacking up the incoming bank notes supplied from the money access opening, sending them out from an internal lower part of a stack of bank notes, stacking up the outgoing bank notes which are sent from an internal upper part of the stack, and supplying the outgoing bank notes to the money access opening;

a conveying attitude aligning unit, connected to to the bank note stacking unit by a bank note conveying means, for conveying the bank notes sent out from the lower part of the bank note stacking unit to a sending out position located thereabove, and aligning the conveying attitude of the bank note which is sorted in the sending in position and conveyed therefrom;

a bank note identifying unit below this conveying attitude aligning unit for identifying the genuineness and the denomination of the bank note conveyed from the conveying attitude aligning unit;

an unidentified bank note temporary storage unit in front of the bank note identifying unit and below the bank note stacking unit for sorting the bank note conveyed from the bank note identifying unit, temporarily storing this bank note, letting the bank note which does not require storage freely through this unit and conveying the bank note to be stored and freely passed bank note to a sending out side of the lower part of the bank note stacking unit;

a face aligning unit below the unidentified bank note temporary storage unit and the bank note identifying unit for sorting the bank note conveyed from the bank note identifying unit so that all the bank notes face the same side up;

a conveying passage, to the rear of the conveying attitude aligning unit and the face aligning unit, which can convey the bank notes from the face aligning unit to the conveying attitude aligning unit; and,

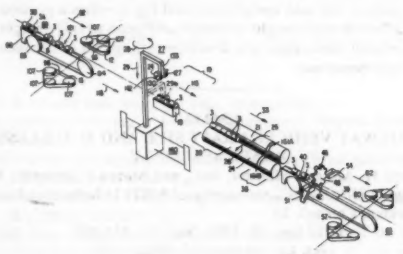
along this conveying passage, an incoming bank note temporary pooling unit which takes in the incoming bank notes from this conveying passage for temporarily pooling and sending out the pooled bank notes to the conveying passage, a plurality of bank note storage units each of which takes in and stores the incoming bank notes of a corresponding denomination from the conveying passage and is associated with the denomination of the outgoing bank notes which are to be sent out to the conveying passage for dispensation, and a bank note recovery unit for taking in the bank notes to be recovered from the conveying passage, in that order from above to below.

4,549,662

TRANSPORT APPARATUS

Frederick C. Schoenig, Jr.; J. David Landry; Edward S. Walker, all of Wilmington, N.C., and Ching C. Lai, Pleasanton, Calif., assignors to General Electric Company, San Jose, Calif.

Filed Mar. 25, 1982, Ser. No. 361,993
Int. Cl.[4] B07C 5/02
U.S. Cl. 209—539 **11 Claims**



1. Apparatus for transporting a succession of substantially cylindrical pellets along a substantially linear, continuous path, comprising:

means for stacking a predetermined number of said pellets in coaxial end-to-end abutment, said stacking means including a pair of belts movably disposed on opposite sides of said path, said belts presenting parallel gripping surfaces to said pellets positioned in a pair of vertical planes;

first pusher means separate from said stacking means and positioned to move the assembled stack of pellets continuously along a portion of said path following said stacking means, said first pusher means including a rotatable thrust pin adapted to apply a force to the trailing pellet of said stack along the stack axis to push said stack along said path portion at a predetermined linear velocity;

means for jointly rotating the pellets present in said path portion at a controlled angular velocity about said stack axis while said stack is being moved by said pusher means;

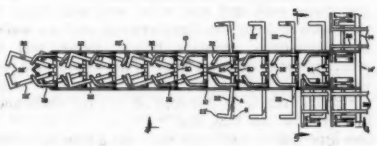
whereby said stack is caused to spiral continuously at a controlled velocity along said path portion.

4,549,663

STORAGE SYSTEM FOR TRAILER FRAMES

Scott S. Corbett, Jr., 6412 SE. 29th Ave., Portland, Oreg. 97202; Lynn F. Perrott, 15928 NE. Rose Pkwy., Portland, Oreg. 97230, and William L. Reiersgaard, Portland, Oreg., assignors to Scott S. Corbett, Jr. and Lynn F. Perrott, both of Portland, Oreg.

Filed Feb. 16, 1983, Ser. No. 466,730
Int. Cl.[4] A47F 7/00
U.S. Cl. 211—13 **13 Claims**



1. A storage system for trailer frames, comprising:

(a) an elongated framework supported in elevated position above a floor in substantially horizontal position and having front and rear ends, and

(b) a plurality of trailer frame support arms mounted on the framework at longitudinally spaced positions for horizontal movement between a retracted position adjacent the framework and an extended position projecting laterally outward of the framework for supporting a trailer frame disposed on end in substantially vertical position, whereby, to allow extension of the retracted support arms sequentially from the rear end toward the front end of the framework to enable trailer frames to be moved longitudinally closely adjacent the elongated framework for loading trailer frames sequentially from the rear end of the framework toward the front end thereof and unloading in the reverse sequence.

4,549,664

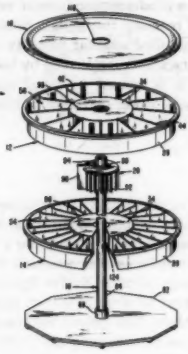
KITTING PARTS CAROUSEL SYSTEM

Norman H. Gowan, Los Angeles; Stasys Petravicius, Rancho Palos Verdes; Ignacio T. Hernandez, Gardena; Robert E. Kuhlmann, Torrance; Donald R. Vande Walle, Jr., Harbor City; Ronald P. Weddell, Huntington Beach; Joseph M. Gates, Gardena; Kenneth J. Sitzwohl, Torrance; Charles D. Sands, San Pedro; Rick A. Gwinn, Torrance, and Milton J. Peterman, Los Angeles, all of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Feb. 23, 1983, Ser. No. 468,822

Int. Cl.[4] A47F *3/14;* B65D *1/36, 21/02*

U.S. Cl. 211—131 **19 Claims**



1. A parts carousel comprising:

a body having a bottom which is frustoconical about an axis and which slopes downwardly in the radially outward direction, a curved junction portion contiguous with said bottom, said curved junction being a portion of a toroid about said axis, said body having an outer wall which is a geometric surface about said axis, said outer wall being contiguous with said curved junction, an inner wall contiguous with said bottom, said inner wall having a surface which is substantially cylindrical about said axis;

a plurality of bin walls permanently molded within said body, said bin walls being substantially radial and each lying in a plane substantially passing through said axis, said bin walls adjoining said bottom, said curved junction, said outer wall and said inner wall and being formed therewith to form bins therebetween, said bin walls being of substantially constant height above said bottom whereby the downward slope of the tops of said bin walls matches the slope of the bottom of another said body which can rest upon the tops of said bin walls and completely close said bins; and

a boss attached to said inner wall and a bearing within said boss, said bearing having a bearing surface about said axis of said body, said body and said bin walls being made of injection molded synthetic polymer composition material.

10. A kitting parts carousel system comprising:

a plurality of carousels including first and second carousels and one cover for said plurality of carousels, each of said carousels having an axis and comprising:

a bearing boss having a central opening on said axis, a bottom which is frustoconical about said axis, said bottom being attached to said boss and said bottom being directed downwardly in the radially outward direction, a curved junction tangent with said bottom, said curved junction being a portion of a torus, an outer wall tangent to said curved junction, said outer wall being a surface of revolution around said axis, a plurality of bin walls permanently molded within with said bottom, said curved section and said outer wall to divide said carousel into separate bins, said bin walls being of uniform height so that each of said bin walls has a top edge which is a fixed distance above said bottom and above said curved junction;

said first of said carousels being positioned on top of said second of said carousels so that the bottom of said first carousel completely encloses the bins of said second carousel;

said cover engaged over said first carousel to close completely said bins in said first carousel; and

said first and second carousel and said cover each being an injection molding made of synthetic polymer composition material.

4,549,665

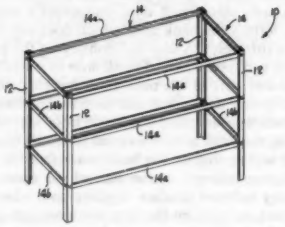
SHELF ASSEMBLY

Bruce B. Smitley, North Canton, Ohio, assignor to Republic Steel Corporation, Cleveland, Ohio

Filed Sep. 3, 1982, Ser. No. 414,554

Int. Cl.[4] A47F *5/00*

U.S. Cl. 211—191 **38 Claims**



1. A storage assembly, comprising:

(a) at least one load supporting upright;

(b) at least one transverse element having an end portion coupled to said upright;

(c) the end portion including a formed pair of spaced projections;

(d) said upright including at least one pair of laterally spaced apertures for receiving and interlocking with said projections, each aperture being defined by a vertical, elongate portion and a transversely extending notch, extending from said elongate portion;

(e) each projecton being defined by a support wall extending from a face of said beam end and supporting a projection surface spaced from said beam face, said projection surface including a laterally projecting lug, spaced above the face of said beam and shaped to fit through the notch in an associated aperture formed in said upright;

(f) said projection support wall defining at least three spaced locations for engaging the elongate portion of said aperture, when said projection is seated such that the engagement between said support wall and said elongate portion substantially prevents relative rotation between said projection and said upright and said lug overlies a portion of a face of said upright to secure said beam to said upright to restrict movement in a direction orthogonal to the face of said beam end.

4,549,666

RAILWAY VEHICLE DRAFT SILL AND SLACKLESS DRAFT ASSEMBLY

Russell G. Altherr, Munster, Ind., and Steven F. Schmitt, Arlington Heights, Ill., assignors to AMSTED Industries Incorporated, Chicago, Ill.

Filed Sep. 30, 1982, Ser. No. 431,246

Int. Cl.[4] B61G *5/02;* B61D *3/10*

U.S. Cl. 213—62 A **5 Claims**

1. A railway vehicle draft sill and slackless draft assembly

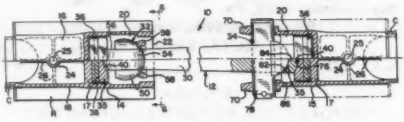
for connecting adjacent rotary dump railway vehicle units, said assembly comprising,

a pair of lengthwise spaced draft sills,

said draft sills each including a frame adapted to extend from a railway vehicle center sill, said frame including a center plate having a center pin opening and a drawbar receiving pocket having a fixed end wall at the inboard end thereof in close proximity to the vertical axis of said center pin opening, bearing wall means supported in said pocket and having a spherical bearing surface,

means maintaining said bearing wall means in fixed spaced relationship to said draft sill end wall,

an elongated drawbar having opposite end portions extending into respective ones of said draft sill drawbar pockets,



said end portions each being provided with spherical ends engaging with said spherical wall bearing surfaces whereby said draft sills and said drawbar are turnable relative to each other,

means keying one of said ends in a respective drawbar pocket to limit said relative turning between said drawbar and said draft sill, and

means mounting the other end of said drawbar in the other of said draft sill drawbar pockets so as to permit relative rotation of said drawbar and draft sill in the dumping mode, the centers of said spherical surfaces at each of said ends of said drawbar defining the respective turning axis at each of said drawbar ends and being in close proximity to the upstanding axis of said center pin opening.

4,549,667

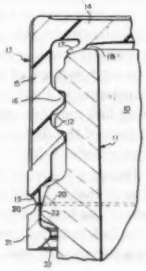
TAMPER INDICATING PACKAGE

Paul W. Dallabaun, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 15, 1984, Ser. No. 589,789

Int. Cl.⁴ B65D *7/28*

U.S. Cl. 215—252 **12 Claims**



1. A tamper indicating package comprising

a container having a neck with external threads formed thereon,

said container having an annular locking bead positioned axially below the threads,

a plastic closure comprising a top panel and an integral depending annular skirt,

said skirt having integral internal threads formed thereon complementary to the threads on the neck of the container,

said skirt having an annular groove cold formed therein defining a ring connected to the upper portion of the skirt by a plurality of circumferentially spaced integral bridge portions located in the groove and defining a weakened portion,

said ring having a radially inwardly extending annular rib engaging beneath the locking bead of the container when the closure is on the container,

said groove being cold formed after molding of the closure by deforming an annular portion of the skirt thereby displacing material in the annular area axially and increasing the length of the skirt and stressing the material in said annular area such that the bridge portions are stressed so that they are strengthened to withstand the compression stresses encountered by engagement of the annular rib on the ring with the annular locking bead of the container and the flexing force on the bridge portions as the annular rib moves radially outwardly over the annular locking bead and flexes inwardly as the closure is applied to the container and such that the bridge portions can be readily broken when the closure is being removed or tampered with.

4,549,668

LID WITH VENT VALVE

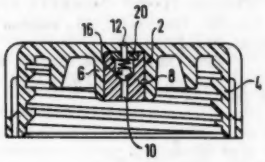
Robert Krauss, and Klaus Binder, both of Munich, Fed. Rep. of Germany, assignors to Peroxid-Chemie GmbH, Höllriegelskreuth, Fed. Rep. of Germany

Filed Jul. 12, 1984, Ser. No. 630,196

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1983, 3325665

Int. Cl.⁴ B65D *51/16*

U.S. Cl. 220—203 **8 Claims**



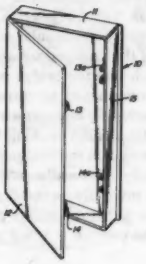
1. A lid with vent valve for packings of gas-evolving products such as organic peroxides or hydrogen peroxide, comprising a lid having an inner side and an outer crown and having a hole extending to and through the inner side and the outer crown and having an annular collar formed on the inner side, a bush including an annular shoulder formed therein and being surrounded flush by the annular collar formed by the lid, the bush having an axial passage widening by way of a conical stage and extending to the hole, a retaining ring which lies in the annular shoulder of the bush and surrounds the axial passage close to the hole, a valve ball in the conical stage and a compression spring which is arranged between the valve ball and the retaining ring, the annular collar having an inner surface which is cylindrical and having an end which is open across the full diameter of the inner surface in a direction away from the outer crown, and the bush including means, comprising at least one section adjoining the annular collar and having a circumferential surface tapering conically from a diameter somewhat greater than the diameter of the inner surface of the annular collar to the diameter of the inner surface of the annular collar, in the direction towards the outer crown, for causing the bush to remain firmly within the annular collar.

4,549,669

LATCH FOR VIDEO CASSETTE CONTAINER

Richard E. Rozporka, San Mateo, Calif., assignor to Tandy Corporation, Fort Worth, Tex.

Filed Oct. 30, 1984, Ser. No. 666,405
Int. Cl.[4] B65D *41/16, 41/18*
U.S. Cl. 220—306 **7 Claims**



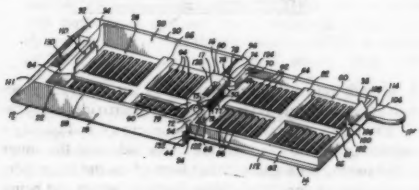
1. In a container with a pivotal closure member, latching means for said closure member comprising: a female part defining an entry leading to an enlarged area relative to said entry, said enlarged area being defined by a pair of opposed concave arcuate surfaces, and a compressible male part sized and shaped to occupy said enlarged area after being compressed through said entry, said male part being formed from a pair of spaced apart parallel elongate members defining thereon a pair of convex surfaces, said spacing permitting compression of the elongate members towards each other to permit passage through said entry, said female part being mounted on one of said container and closure member, and said male part being mounted on the other of said container and said closure member.

4,549,670

HINGED TISSUE CASSETTE APPARATUS

David Trendler, Libertyville, Ill., assignor to MacLean-Fogg Company, Mundelein, Ill.

Filed Dec. 19, 1984, Ser. No. 683,559
Int. Cl.[4] B65D *43/14, 51/04*
U.S. Cl. 220—338 **18 Claims**



1. Apparatus for containing a tissue specimen during contact of said tissue specimen with a processing liquid comprising;

a liquid-penetrable receptacle having one or more wall members defining an open area adapted to receive a tissue specimen and adapted to support a liquid-penetrable cover member;

a separate liquid-penetrable cover member adapted to be supported on said receptacle to cover said open area in a closed position to prevent said tissue specimen from inadvertent removal from said receptacle with the cover member disposed to cover said open area;

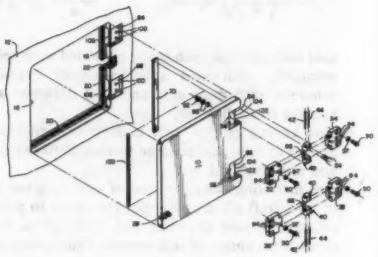
said cover member being attachable to and detachable from said receptacle through a flexible, elastic hinge member such that when the cover member is attached to the receptacle at the hinge member, the cover member is rotatable about said hinge member to an open position permitting placement of a specimen within the receptacle and to a closed position containing a specimen within the receptacle for liquid processing and after liquid processing, the cover member can be removed from the receptacle by elastic flexing of the hinge member without substantial damage to said hinge member.

4,549,671

FLUSH MOUNTED HINGE ASSEMBLY HAVING A FLOATING LINK

William A. Fay, III, Dover, Pa., assignor to Harsco Corporation, Wormleysburg, Pa.

Filed Jul. 3, 1984, Ser. No. 627,562
Int. Cl.[4] E05D *3/06*
U.S. Cl. 220—344 **8 Claims**



1. A hinge assembly for pivotally mounting a closure on an armored vehicle having an opening in its hull such that the closure in a closed position is disposed within the opening and is flush with an exterior surface of the hull and, in an open position, is pivotal at least 180° away from said opening, the hull providing a backing stop having a seal for the closure, the hinge assembly comprising first and second spaced pairs of first and second hinge plates, the hinge plates of each pair being pivotally connected to an intermediate hinge member so as to enable the first and second hinge plates to pivot about respective first and second substantially parallel axes, the first hinge plate of each pair adapted to be mounted in a first recess in the exterior surface of the hull adjacent to said opening and the second hinge plate of the pair adapted to be mounted in a second recess in another exterior surface of the closure such that the hinge plates are substantially flush with the exterior surfaces; an elongated floating link member extending between the intermediate hinge members of the first and second spaced pairs of hinge plates, the intermediate hinge members being mounted on an outwardly facing surface of the link member offset to a first side thereof such that the first axis is positioned laterally beyond the first side of the link member and such that an opposite second side of the link member extends laterally in an opposite direction beyond the second axis.

4,549,672

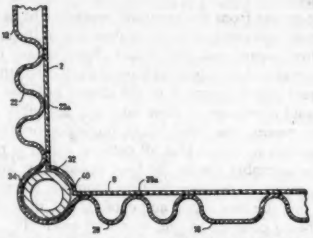
DOUBLE-WALL CONTAINER

Isaac Rinkewich, 12 Fishman Maimon St., Tel-Aviv, Israel

Filed Jan. 10, 1985, Ser. No. 690,186
Int. Cl.[4] B65D *1/44, 1/48, 6/34, 25/18*
U.S. Cl. 220—441 **20 Claims**

1. A double wall container, including inner and outer side walls joined together in spaced relationship, and inner and

outer bottom walls joined together in spaced relationship; said outer side walls being integrally formed with semi-tubular ribs



extending heightwise of the container and joined at their apices to the inner side walls of the container.

4,549,673

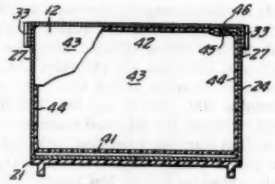
COLLAPSIBLE CONTAINER FOR LIQUIDS

Julius B. Kupersmit, 299 W. 12th St., New York, N.Y. 10011

Filed Nov. 26, 1984, Ser. No. 674,940

Int. Cl.[4] B67B *7/24*

U.S. Cl. 220—465 **4 Claims**



1. An improved collapsible shipping container comprising: a collapsible outer container element and a collapsible impermeable liquid-proof inner bottle element; said outer container element including a main body having a lower wall, a plurality of foldably interconnected side walls extending therefrom to define an upwardly facing opening to a rectangularly-shaped void, and a cover member including a planar wall selectively overlying said opening; said bottle element being molded integrally of a flexible synthetic resinous material to include a bottom wall, a plurality of opposed side and end walls, and an upper wall and being of dimensions and configuration corresponding to the void formed by said main body element; said bottle element having a sealable inlet opening in the area of said upper wall and a sealable drain opening in the area of said lower wall; at least some of the walls of said bottle element having elongated areas of relatively thin cross sections to permit folding thereon for the purpose of collapsing said bottle element when empty to substantially planar condition; whereby, upon readying said outer container for use, said outer container element is placed in erected condition to form said void and said bottle element is placed therein to be inflated in situ to substantially fill said void prior to loading; said bottle element, when subsequently empty being collapsible to relatively planar condition.

4,549,674

PERFUME DISPENSER

Girair H. Alticosalian, 27, Beaufort Rd., Ealing, London, W.5, England

Filed Mar. 7, 1983, Ser. No. 472,622

Claims priority, application United Kingdom, Mar. 9, 1982, 8206891

Int. Cl.[4] B67D *5/22, 5/52, 83/00;* **B65D** *83/00*

U.S. Cl. 222—48 **6 Claims**

1. A perfume dispenser having means for separately storing a plurality of liquid perfumes each of a different fragrance, a selector device which enables any one liquid perfume or any combination of liquid perfumes to be selected for dispensing through an outlet of the dispenser and an actuating means operable to cause the release of a quantity of the selected liquid perfume or perfumes into a mixing chamber and from said chamber to said outlet, wherein said dispenser is provided with a body which is divided internally into a plurality of compartments each of which forms a store for containing a different liquid perfume under pressure, said actuating means includes a depressable cap which also forms the selector device and which is mounted on and rotatable relative to said body to different predetermined dispensing positions, and which carries an outlet nozzle through which the selected perfume or

combination of perfumes is dispensed and a tubular member of resilient material is provided to conduct the selected perfume or combination of perfumes from said mixing chamber to said outlet nozzle, said tubular member also providing a resilient force against which the cap is depressed to actuate the dispenser to dispense said selected perfume or mixture of perfumes from said outlet nozzle, and in which said depressable cap is adapted to fit over an adjacent part of the body of the dispenser and an inner skirt is located coaxially within said cap and wherein projections are located within said inner skirt, one or more of said projections being operable for each predetermined dispensing position of the cap to actuate an outlet valve of a perfume store, dependent upon the selection made, so as to release one or more liquid perfumes via the mixing chamber as a spray or mist from the outlet nozzle.

4,549,675

BEVERAGE DISPENSING VALVE

Forrest L. Austin, Brooklyn Center, Minn., assignor to The Cornelius Co., Anoka, Minn.

Filed Sep. 7, 1982, Ser. No. 415,505

Int. Cl.[4] B67D *5/56*

U.S. Cl. 222—129.1 **16 Claims**

1. A post-mix beverage dispensing valve, comprising:

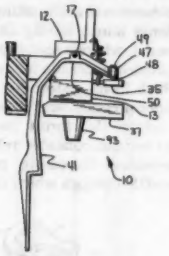
a. a valve main body having a pair of substantially horizontal ports side by side to each other, one port being for water and the second port being for syrup;

b. a pair of horizontal pallet valves, each valve having an actuator anvil to the front of the valve main body;

c. a horizontal valve block underneath the pallet valves and secured to the valve main body, with the pallet valves being held between the block and the main body, said block having upward facing valve seats upon which the valves normally sit;

d. a dispensing nozzle extending downward from the valve block; and

e. an actuator hammer pivotally mounted in the main block, said hammer reaching over the valves and the valve block



to in front of the main body and the block to reach and make operative contact with the valve anvils.

4,549,676

LIQUID MIXING AND PURGING APPARATUS

Horst Gerich, 24034 Welby Way, Canoga Park, Calif. 91307

Filed Sep. 16, 1983, Ser. No. 532,590
Int. Cl.[4] B67D *5/60*
U.S. Cl. 222—145 **10 Claims**

1. An apparatus for the mixing, dispensing and purging of a composite liquid consisting of at least a base liquid and a catalyst liquid reactive with each other comprising:

(a) a first supply source of base liquid;

(b) a second supply source of catalyst liquid;

(c) power means to pressurize each of said supply sources;

(d) a manifold assembly comprising a liquid check means for inhibiting the flow of catalyst liquid therethrough; said liquid check means being movable to an open position upon a predetermined pressurization of the second supply source of the catalyst liquid, thereby permitting the catalyst liquid to flow from the second supply source into the manifold assembly; said liquid check means being movable to a closed position upon decrease of the pressurization of the catalyst liquid below said predetermined pressurization, thereby stopping the flow of catalyst liquid from the second supply source into the manifold assembly;

(e) first means for coupling said pressurized supply source of base liquid to said assembly;

(f) second means for coupling said pressurized source of catalyst liquid to said assembly;

(g) the base liquid and catalyst liquid intermixing in the manifold assembly when the liquid check means is in said open position;

(h) pressure relief means, disassociated from said power means, for lowering the pressurization of the catalyst liquid, said pressure relief means coupled intermediate said second pressurized supply source of catalyst liquid and said liquid check means and being operable to vent said second source to atmospheric pressure which is lower than the pressurization of the second source;

(i) means to activate said pressure relief means when the pressurization of the catalyst liquid is below said predetermined pressurization, thereby insuring that the liquid check means will remain in the closed position, while simultaneously continuing the pressurization of said base liquid such that it continues to flow into the manifold assembly;

(j) an exit means from the manifold assembly to permit the base liquid and catalyst liquid to flow out of the assembly;

(k) said first means and said liquid check means being so constructed and arranged relative to each other that when said liquid check means is in the closed position and the base liquid continues to flow into said assembly and out the exit means, the base liquid impinges on the liquid check means to insure that all catalyst liquid is removed from the assembly due to the base liquid flow; and,

(l) mixing means to receive the flow from the assembly and further mix the base liquid and catalyst liquid, said mixing means being coupled to said manifold assembly.

4,549,677

CASTING OF ALUMINIUM-KILLED STEELS

Emilio Marino, and Aldo Ramacciotti, both of Rome, Italy, assignors to Centro Sperimentale Metallurgico S.p.A., Rome, Italy

Filed Jun. 2, 1983, Ser. No. 500,305
Claims priority, application Italy, Jul. 5, 1982, 48757 A/82
Int. Cl.[4] B22D *41/08*
U.S. Cl. 222—591 **1 Claim**

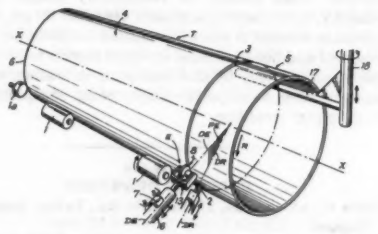
1. A nozzle for the casting of aluminium-killed steel, which is prepared from pellets obtained by mixing 90–99% $Ca(OH)_2$, with at least one compound selected from the metal oxides Fe_2O_3, Al_2O_3 and TiO_2 and the chlorides $CaCl_2$, NaCl and LiCl, in quantities between 1 and 10%, the mixture being pelletized, dried at 100°–150° C. and baked at 800°–1600° C., grounded and screened, the screened material then being further mixed with at least one compound selected from among the metallic oxides Fe_2O_3, Al_2O_3, TiO_2, ZrO_2, Cr_2O_3 and MoO_3 and the chlorides $CaCl_2$, NaCl and LiCl in quantities between 3 and 20% by weight, as well as with organic binders and carriers such as oil, paraffin, petroleum, lower alcohols and resins in quantities betweel 1 and 5%; said mix is pressed in molds at 500–1500 kg/cm^2 and baked at 1500°–1800° C., the body thus obtained then being vacuum-impregnated with molten pitch and cooked at about 700° C. in a reducing atmosphere.

4,549,678

METHOD AND APPARATUS FOR SEPARATING A CUT TUBE END

Claude B. Fuminier, Pont-A-Mousson, France, assignor to Pont-A-Mousson S.A., Nancy, France

Filed Jan. 13, 1984, Ser. No. 570,311
Claims priority, application France, Jan. 31, 1983, 83 01462
Int. Cl.[4] B26F *3/00*
U.S. Cl. 225—2 **11 Claims**



1. A method for separating a cut end (5) from a tubular element (T), such as a cast iron pipe, comprising the steps of: horizontally arranging the tubular element on support and retention means enabling its rotation around a longitudinal axis

(X—X), immobilizing the element against axial translation, rotationally driving the element, cutting off an end (5) by moving a non-rotatable, material removal cutting tool (2) towards the tubular element axis in a radial direction (DR), and progressively radially advancing a circumferentially spaced separating wedge (E,8) having a profile of an isosceles trapezoid into a generally rectangular groove (3) made by said tool during cutting, said wedge being rotatably mounted around an axis (Y—Y) parallel to the longitudinal axis of the tubular element on a support (16, 13) capable of advancing towards said groove, said advance or penetration taking place in a plane (PE) perpendicular to the axis of said tubular element in a radial direction (DE) of approach towards said axis (X—X), said wedge engaging said groove and exerting axial pressure on the end (5) of the tubular element to be severed, which causes the moving apart and separation of the cut end (5) at the end of the cutting operation to prevent the falling of said end onto the cutting tool.

4,549,679

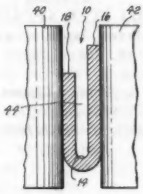
METHOD FOR SLITTING AMORPHOUS METAL

Bruce R. Watson, Hickory, N.C., assignor to General Electric Company, King of Prussia, Pa.

Filed Jan. 26, 1984, Ser. No. 574,233

Int. Cl.[4] B26F *3/00*

U.S. Cl. 225—2 **21 Claims**



1. A method for slitting a strip of amorphous metal comprising:

(a) scribing a line in a first surface of said strip;

(b) folding the parts of said strip located on opposite sides of said scribed line toward each other along said line to form a folded strip having said line within the fold;

(c) moving said parts sufficiently close together adjacent said line to form a crease; and

(d) at least partly flattening said crease whereby said strip separates into first and second strips on opposed sides of said line.

4,549,680

PRECISE INTERMITTENT FEEDING APPARATUS FOR EDGEWISE PERFORATED CARRIER SHEET MATERIAL

Richard L. Brown, Bellevue, Nebr., assignor to Idea Engineering Company, Plattsmouth, Nebr.

Filed Dec. 3, 1984, Ser. No. 677,247

Int. Cl.[4] B65H *17/36, 17/44*

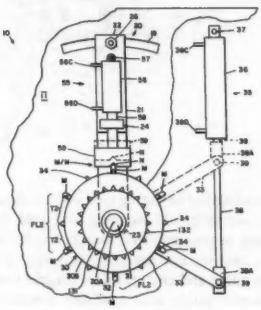
U.S. Cl. 226—76 **17 Claims**

1. For indefinitely longitudinally lengthy carrier sheet material having a pair of substantially parallel longitudinally extending edges including a first-edge transversely spaced away from a second-edge thereof, said carrier along at least one of the two longitudinal edges thereof being provided with perforations spaced at regular-intervals, said perforations being of substantially identical shape and each having a prescribed finite-area, said carrier being provided with carried-members incrementally spaced at finite-lengths along the carrier longitudinal length, apparatus for accurately intermittently feeding the carrier at regular longitudinally extending exact finite-lengths, and said apparatus comprising:

(A) a framework including supporting means for supporting plunger means having a linearly reciprocatable piston terminating at a leadward-end;

(B) a cylindrically surfaced drum rotatable about a transversely extending drum-axis intersecting said framework, said drum cylindrical surface concentrically surrounding said drum-axis and having a finite-circumference, a plurality of prongs respectively extending radially outwardly from the drum cylindrical surface and said prongs being in a uniplanar circular array spaced at regular-intervals and whereby the finite-circumference is an exact multiple of said regular-intervals, and said prongs being of substantially identical cross-sectional shape and having a cross-sectional size of substantially said finite-area, at least one of said circumferentially spaced prongs being engageable through a like number of carrier edgewise perforations as said drum is being rotated;

(C) camming means of the two components pin-and-block type, a first-component of the camming means being distributed in a uniplanar circular array spaced at regular-spacings on said drum and at a substantially uniform finite-radius about the drum-axis;



(D) intermittent driving means for intermittently rotating the drum including its circularly arrayed prongs and camming means first-component at prescribed angular-value cycles whereby each driving cycle feeds the prong engaged carrier sheet material for a longitudinal approximate-length roughly equivalent to the desired exact finite-length; and

(E) plunger means mounted to said framework supporting means and including a linearly reciprocatable piston, a second-component of the camming means being provided at the piston leadward-end, said camming means second-component being co-actably slidably moveable relatively against said drum mounted first-component and there defining an apparatus indexing-station whereby, at the conclusion of each angular-value cycle, the camming means second-component is co-actably moveable against the camming means first-component and rectify the previously attained approximate-length carrier feed into the exact finite-length feed desired for the carrier sheet material.

4,549,681

POWER-DRIVEN TACKER WITH SAFETY DEVICE

Kunio Yamamoto; Kaoru Ichikawa, and Seki Moriguchi, all of Katsuta, Japan, assignors to Hitachi Koki Company, Ltd., Tokyo, Japan

Filed Oct. 1, 1984, Ser. No. 656,368

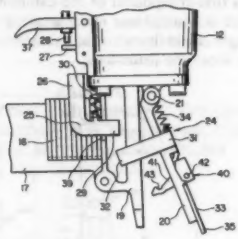
Claims priority, application Japan, Oct. 1, 1983, 58-152982[U]

Int. Cl.[4] B21J *15/28;* B27F *7/17;* B25C *5/02*

U.S. Cl. 227—8 **5 Claims**

1. A power-driven fastener driving machine for driving fasteners into a workpiece, comprising:

(a) a housing including a reciprocally movable blade;
(b) switch means mounted on said housing for actuating said reciprocally movable blade;
(c) a guide assembly mounted on said housing and composed of a first guide fixed to said housing and a second guide pivotally mounted on said housing, said second guide being movable between a first position in which said first and second guides mate with each other to define a drive track through which said blade is reciprocally movable and a second position in which said second guide is angularly spaced from said first guide to open said drive track;
(d) a magazine mounted on said housing and said guide asembly for feeding fasteners one at a time into said drive track; and
(e) a safety device composed of first and second separate members, said first member being movably mounted on



said housing for engaging said switch means, a first spring acting between said housing and said first member for normally urging said first member away from said switch means, the second member movably mounted on said second guide and engageable with said first member when said second guide is in said first position, and a second spring acting between said housing and said second member for normally urging said second member to keep a distal end thereof projecting beyond said second guide, whereby when said distal end of said second member is pressed against the workpiece at the time said second guide is in said first position, said second member engages said first member to cause said first member to actuate said switch means, and when said second guide is in said second position, said second member is kept out of engagement with said first member.

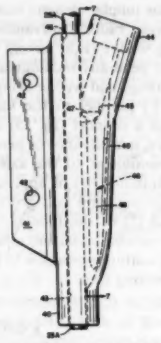
4,549,682

PORTABLE PNEUMATIC NAIL DRIVING APPARATUS

Francis A. Hebert, Schriever, La., assignor to Soloco, Inc., Lafayette, La.

Continuation-in-part of Ser. No. 386,311, Jun. 8, 1982, Pat. No. 4,436,235. This application Jun. 13, 1983, Ser. No. 503,551
The portion of the term of this patent subsequent to Mar. 13, 2001, has been disclaimed.
Int. Cl.⁴ B25C *1/02*
U.S. Cl. 227—119 **2 Claims**

1. In combination, a nail driving apparatus comprising a base member with guides upstanding therefrom and a cradle movable thereover carrying a percussive air hammer attached thereto and having a nail driving chisel extending therefrom and wherein one of said guides forms a nail chute for delivering nails to be driven by said chisel; a nail driving barrel means comprising a nail driving barrel adapted to be positioned on said base member to receive the nail driving chisel, nail transfer chute means positioned to receive nails from said guide, and antijam means between said transfer chute and chisel causing a nail fed from said transfer chute means to be pivoted and hung by its head out of the way of the chisel until the chisel is raised



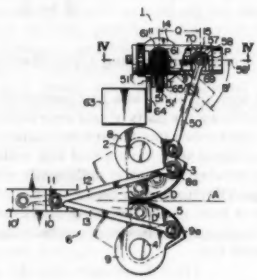
clear of contact with the nail head permitting the nail to drop into the barrel in position to be driven by the chisel.

4,549,683

ROLL FEED APPARATUS

Heizaburo Kato, Ichikawa, Japan, assignor to Sankyo Manufacturing Company, Ltd., Tokyo, Japan

Filed Aug. 1, 1983, Ser. No. 519,174
Claims priority, application Japan, Feb. 22, 1983, 58-24892[U]; Feb. 22, 1983, 58-24893[U]
Int. Cl.⁴ B65H *17/36, 17/44*
U.S. Cl. 226—142 **9 Claims**



1. A roll feed apparatus comprising:
an oscillation driving device;
a main sector roll integrally carried by a main roll shaft and adapted to be oscillatorily driven by said oscillation driving device;
a sub-sector roll integrally carried by a sub-roll shaft extending parallel to said main roll shaft, said sub-sector roll being adapted to cooperate with said main sector roll so as to clamp a sheet material therebetween and feed the same along a planar path of feed;
a driving connection mechanism for drivingly connecting said main sector roll and said sub-sector roll to each other in such a manner that, when said main sector roll is rotated in one direction by a predetermined angle, said sub-sector roll is rotated in the opposite direction substantially by the same angle as said main sector roll; and
a roll release device adapted to cause a relative movement between said main sector roll and said sub-sector roll away from each other when said sector rolls are rotated in the directions opposite to those for feeding said sheet

material thereby to release said sheet material from the clamping force exerted by said sector rolls;

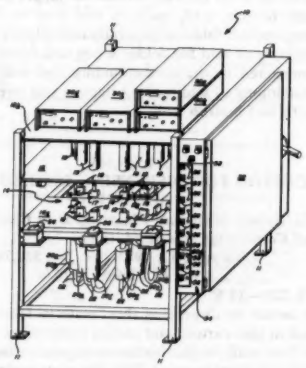
wherein said driving connection mechanism includes a first oscillation arm mounted on a portion of said main roll shaft extending outside of said main sector roll, a second oscillation arm mounted on a portion of said sub-roll shaft extending outside of said sub-sector roll and positioned substantially in the same plane as said first oscillation arm, a guide member disposed near the point of intersection between said plane and the path of feed of said sheet material and provided with a guide groove extending in the direction of feed of said sheet material, a sliding member slidably disposed in said guide groove, and a first link and a second link connecting said sliding member to said first and second oscillation arms, respectively, said first and second links being arranged substantially in symmetry with each other with respect to the plane of said feed path of said sheet material at such an inclination to said feed path plane as to form a V-shape having an apex located at the position of said sliding member and such that said movement between said main sector roll and said sub-sector roll away from each other and a return movement between said main sector roll and said sub-sector roll toward each other causes corresponding changes in said inclination of said first and second links relative to said feed path plane, and said second oscillation arm being adapted to be oscillatorily driven by said first oscillation arm through said sliding member and said first and second links even when said inclination changes because of said movements between said main sector roll and said sub-sector roll.

4,549,684

ULTRASONIC WELDING SYSTEM AND METHOD EMPLOYING A REDUCED NUMBER OF POWER SUPPLIES

Gary R. Telly, and Scott R. Telly, both of 6202 Whispering Oaks, Washington, Mich. 48094

Filed Feb. 25, 1983, Ser. No. 469,776
Int. Cl.[4] B23K *20/10;* **B29C** *27/08*
U.S. Cl. 228—110 **17 Claims**



1. In an ultrasonic welding system which includes: r.f. power generating means for transmitting r.f. signals; a plurality of transducers for (1) receiving the r.f. signals from the r.f. power generating means, (2) converting the r.f. signals into acoustic energy, and (3) transmitting the acoustic energy into an associated welding horn; and a plurality of welding horns for (1) receiving the acoustic energy from an associated transducer and performing a plurality of ultrasonic welding operations on a workpiece, the improved welding system comprising, in combination:

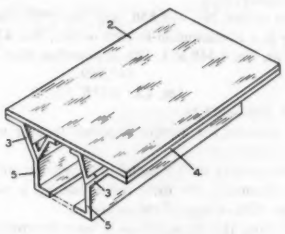
means for sequentially providing a preselected individually tuned r.f. signal to each of the transducers from the r.f power generating means, whereby a single r.f. generating means is adapted to sequentially supply specifically tuned power to each of a plurality of the transducers so that individually tailored acoustic energy may be transmitted to each of the welding horns.

4,549,685

METHOD FOR SUPERPLASTIC FORMING AND DIFFUSION BONDING Y SHAPED SUPPORT STRUCTURES

Carlos A. Paez, Huntington, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Continuation of Ser. No. 285,015, Jul. 20, 1981,. This application Feb. 10, 1984, Ser. No. 578,597
Int. Cl.[4] B23K *20/18;* **B21D** *26/02*
U.S. Cl. 228—118 **6 Claims**



1. A method of forming a Y shaped structural unit adapted for use in aircraft comprising:

(a) selecting and sizing a top layer and a bottom layer of material of predetermined thickness adapted for diffusion bonding and superplastic forming:

(b) selecting and sizing at least one separate intermediate plate of material of predetermined thickness adapted for diffusion bonding and superplastic forming, said at least one separate intermediate plate being substantially less in length and width than said top and bottom layers;

(c) selectively coating said at least one separate intermediate plate and at least one of said top and bottom plates with stop-off so that a relatively small edge portion of said at least one intermediate plate can be diffusion bonded to said top and bottom layers;

(d) assembling a sandwich unit of said top, said bottom and said at least one separate intermediate plate;

(e) placing said sandwich unit between an upper and lower die, at least one of said dies including a cavity,

(f) subjecting said sandwich unit to sufficient pressure and heat so as to diffusion bond those surfaces of said top, bottom and said at least one intermediate plate not coated with stop-off,

(g) directing an inert gas under pressure between the layers of said sandwich so as to superplastically form the sandwich unit into cavities so that said at least one separate intermediate plate are diffusion bonded to said top and bottom layers to form a Y shaped structural unit having a substantially triangularly shaped space between portions of the upper and lower layers and the said at least one intermediate plate.

4,549,686

VAPOR PHASE SOLDERING USING PERFLUOROTETRADECAHYDROPHENANTHRENE ($C_{14}F_{24}$)

Colin R. Sargent, Nailsea; Keith Brierley, Bristol; David E. M. Wotton, Stoke Bishop, and Paul L. Coe, Northfield, all of England, assignors to I.S.C. Chemicals Limited, London, England

Filed Apr. 30, 1984, Ser. No. 605,410

Claims priority, application United Kingdom, May 6, 1983, 8312503

Int. Cl.⁴ B23K *3/00*

U.S. Cl. 228—242 **3 Claims**

1. In a method of soldering wherein a component to be soldered is immersed in a vapour bath to melt the solder, and the component is then withdrawn from the vapour bath, the improvement comprising that the vapour bath is composed predominantly of perfluorotetradecahydrophenanthrene ($C_{14}F_{24}$).

4,549,687

HOMOGENEOUS LOW MELTING POINT COPPER BASED ALLOYS

Debasis Bose, Randolph; Amitava Datta, Morris Township, Morris County, and Nicholas J. DeCristofaro, Chatham, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 488,858, Apr. 26, 1983, Pat. No. 4,448,852, which is a continuation-in-part of Ser. No. 420,550, Sep. 20, 1982, Pat. No. 4,448,851. This application Mar. 8, 1984, Ser. No. 587,719

Int. Cl.⁴ B23K *35/30*

U.S. Cl. 228—263.18 **5 Claims**

1. A process for joining together two or more metal parts which comprises:

(a) interposing a filler metal between the metal parts to form an assembly, the filler metal having a melting point less than that of any of the parts;

(b) heating the assembly to at least the melting temperature of the filler metal; and

(c) cooling the assembly; wherein the improvement comprises employing, as the filler metal, a homogeneous copper based foil having a composition consisting essentially of about 2.5 to 11 atom percent tin, about 0 to 12 atom percent nickel, about 11 to 15 atom percent boron, the balance being copper and incidental impurities and the total of copper and tin ranging from about 85 to 89 atom percent.

4,549,688

EXPANDABLE FILE FOLDER

Laird M. Ozmon, 1130 N. Dearborn, Chicago, Ill. 60610, and Stephen R. Welch, 1227 S. Wilke #110, Arlington Hts., Ill. 60005

Filed Aug. 26, 1983, Ser. No. 526,862

Int. Cl.⁴ B65D *5/18*

U.S. Cl. 229—1.5 R **9 Claims**

1. An expandable file folder made from a substantially unitary blank of relatively stiff sheet plastic or the like defining:

a front panel,

a rear panel,

said front and rear panels being of substantially identical generally rectangular size and having upper and lower longitudinal edges and transverse end edges,

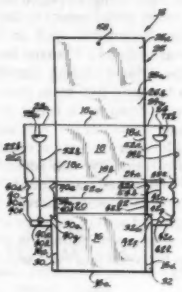
a rectangular bottom wall connected along opposite marginal edges to said front and rear panels along fold lines, said bottom wall having a longitudinal fold line substantial midway between its said marginal edges,

a selected one of said front and rear panels having an end wall connected to each of its opposite transverse end edges through a fold line, each of said end walls having a generally central fold line extending longitudinally thereof, and having a lower transverse edge coextensive with the lower longitudinal edge of the selected panel,

the other of said front and rear panels having a connecting tab hingedly connected to each of its opposite transverse end edges in a manner to enable folding of said connecting tabs for connection to a corresponding one of said end walls,

a top closure flap connected to the upper longitudinal edge of said rear panel in a manner enabling folding of said closure flap so that a portion thereof lies in juxtaposed relation with said front panel,

and a generally rectangular tucking flap hingedly connected to the lower transverse edge of each of said end walls so as to enable folding to a position substantially normal to



the plane of the corresponding end wall, said tucking flaps each having opposite substantially parallel free edges defining a lateral width less than the lateral width of the corresponding end wall and being removably positionable to overlie said bottom wall in juxtaposed relation therewith, each of said tucking flaps further having a longitudinal length sufficient to overlie at least one-half the length of said bottom wall when in said overlying relation therewith so as to provide additional supporting strength for said bottom wall, each of said tucking flaps having a longitudinal fold line generally central thereof to facilitate collapse of said file folder when said connecting tabs are connected to the corresponding end walls but prior to positioning of said tucking flaps in said overlying relation with said bottom wall.

4,549,689

CARTON FOR DISPENSING ROLLED SHEET MATERIAL

John G. Bailey, Matteson, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Aug. 12, 1983, Ser. No. 522,744

Int. Cl.⁴ B65D *85/67*

U.S. Cl. 229—17 S **15 Claims**

1. A carton for dispensing sheet material from a roll thereof disposed in said carton, said carton comprising:

(a) a front wall panel, a bottom wall panel, a back wall panel, and a top wall panel foldably connnected together in series;

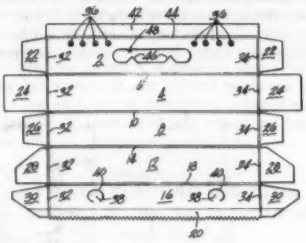
(b) a plurality of end closure flaps foldably connected to respective ones of said panels to form end closures for said carton;

(c) a hood panel foldably connected to said top wall panel to overlie an outer surface of said front wall panel;

(d) material cutting means disposed at an edge of one of said panels for severing material dispensed from said roll of material; and

(e) means forming an opening in said front wall panel, said opening having an upper edge and a lower edge spaced downwardly from said upper edge and means forming at

least one locking projection in said front wall panel at the lower edge of said opening in said front wall panel, said locking projection extending upwardly toward but terminating short of said upper edge of said opening in said front wall panel and being positioned to overlap an outer surface of a lower edge of said hood panel when the latter is juxtaposed to said front wall panel whereby said hood



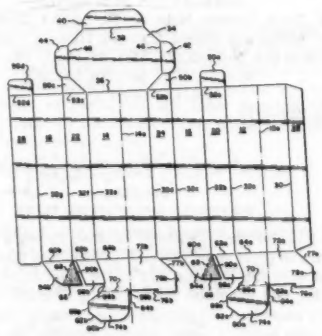
panel can be releasably locked into overlying relationship with said front wall panel to close the carton, said opening being formed by boundaries of at least one flap cut in said front wall panel which flap is pivotable into said carton about a fold line defining said upper edge of said opening and said flap having a lower edge contoured to form said locking projection in the portion of said front wall panel adjacent said flap lower edge.

4,549,690

COLLAPSIBLE BOTTOM STRUCTURE FOR EIGHT-SIDED CONTAINER

Charles W. Rosenburg, North Tonawanda, N.Y., assignor to F. N. Burt Company, Inc., Buffalo, N.Y.

Filed Jul. 26, 1984, Ser. No. 634,633
Int. Cl.⁴ B65D *5/36*
U.S. Cl. 229—41 C **16 Claims**



1. An eight-sided container comprising:

a main body which, when fully erected is of tubular form, the main body including four pairs of opposed rectangular side panels and a side glue flap which is hingedly connected to one side panel and glued to the surface of another side panel, each of the other side panels being hingedly secured to adjacent panels; and

a bottom formed of six die cut bottom flaps associated with six of the side panels, the bottom flaps including

a first pair of opposed bottom flaps, each including first and second generally triangular portions, one edge of the first triangular portion being hingedly secured to one edge of an associated side panel, and the second triangular portion having one edge hingedly secured to another edge of the first triangular portion, said second triangular portion acting as a bottom glue flap,

a second pair of opposed bottom flaps, each including one edge hingedly secured to one end of an associated side panel, the second pair of bottom flaps being disposed adjacent the first pair of opposed bottom flaps with each of the second triangular portions of the first pair being glued to a surface of an adjacent one of the second pair of opposed bottom flaps, and

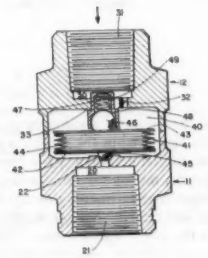
a third pair of opposed bottom flaps which are substantially larger than the first and second pairs, each one of the third pair of flaps including first and second portions, one side edge of the first portion being hingedly secured to the bottom edge of an associated side panel of a first pair of opposed side panels, and the second portion extending away from the first portion and being disposed to one side of a longitudinally extending center line of the side panel to which the first portion is secured, the second portion additionally overlying a part of the first portion of the other one of the third pair of flaps.

4,549,691

DUAL MODE BELLOWS-ACTUATED THERMOSTATIC STEAM TRAP

Niranjan T. Jiandani, Emmaus, Pa., assignor to Spirax Sarco, Inc., Allentown, Pa.

Filed Jan. 11, 1984, Ser. No. 569,977
Int. Cl.⁴ F16T *1/02*
U.S. Cl. 236—58 **2 Claims**



1. A dual mode bellows-actuated thermostatic steam trap comprising:

(a) a first, generally cylindrical housing portion, having a hollow interior, said housing portion including a passage extending from the exterior to the interior thereof along its longitudinal axis, said passage terminating in a valve seat located at the point where it enters said hollow interior;

(b) a second, generally cylindrical housing portion, also having a hollow interior, mounted in mating co-axial juxtaposition to said first housing portion to define therewith a housing having an internal chamber, said second housing portion being provided with a longitudinal passageway extending from exterior to interior, and a bellows attachment face located on the longitudinal axis of said housing portion proximate the terminus of said passageway, said passageway beginning as a single bore and dividing into a plurality of smaller offset bores which are radially distributed about said bellows attachment face;

(c) a bellows having a top, a bottom and accordion sides located within said internal chamber, the interior of said bellows containing a volatile liquid whose saturation curve closely parallels but is a few degrees below that for saturated steam, the top of said bellows containing a valve which is in operative contact with the valve seat of said first housing portion and the bottom of said bellows being proximate said bellows attachment face;

(d) a sphere centrally affixed to the bottom of said bellows and a hollow, internally shouldered, sleeve mounted on said attachment face, said sphere being permanently but rotatably retained within said sleeve to provide pivotal connection of said bellows and to assure longitudinal self-alignment of said valve and said valve seat as the bellows expands and contracts;

whereby, when the passage in the first housing portion is utilized as an outlet, the trap operates in a first mode but, when said trap is reversed with said passage being utilized as an inlet, the trap operates in a second mode.

4,549,692

HEATING AND/OR AIR-CONDITIONING INSTALLATION FOR MOTOR VEHICLES

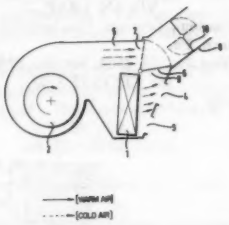
Lothar Busch, Gilching, and Walter Orth, Munich, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke A.G., Fed. Rep. of Germany

Filed Aug. 17, 1983, Ser. No. 524,095

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1982, 3232957

Int. Cl.[4] G05D *23/00*

U.S. Cl. 237—12.3 A **10 Claims**



1. An air distribution arrangement for providing temperature stratification within the interiors of motor vehicles comprising heat exchanger means for heating air flowing therethrough, bypass means for conducting unheated air past said heat exchanger means, opening means for conducting air flowing through said heat exchanger means to a first predetermined area within the interior of a motor vehicle, channel means for conducting air passing therethrough to a second predetermined area of the interior of said motor vehicle, and further means for selectively mixing unheated air flowing in said bypass means with a flow of air heated by said heat exchanger and for controlling the amount of air passing through said chanel means, said further means including throttle means operable for controlling the amount of air flowing through the channel means and control means for controlling the mixing of unheated air flowing in said bypass means with said flow of air heated by said heat exchanger means, said control means being positionable in intermediate positions between a first extreme position allowing only unheated air to flow to said second predetermined area and a second extreme position allowing only heated air to flow to said second predetermined area, wherein the temperature of air conducted to said second predetermined area is variable independently of the temperature of the air conducted to said first predetermined area.

4,549,693

CONTAINER

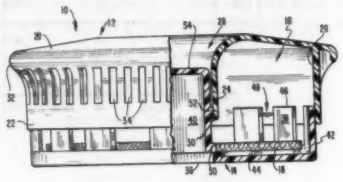
John J. Barlics, 7 Denver Blvd., North Edison, N.J. 08820

Filed Jun. 20, 1983, Ser. No. 505,830

Int. Cl.[4] A61L *9/04*

U.S. Cl. 239—58 **61 Claims**

1. A container, comprising a housing having a chamber therein, said housing including a first housing member having an aperture therein and a second housing member cooperating with said first housing member to form said chamber, said first and second housing members being slidably movable toward and away from each other between a first position in which said first and second housing members cooperate to substantially isolate said chamber from the outside atmosphere, whereby said container is closed when said first and second housing members are in said first position, and a second position in which said first and second housing members cooperate to permit substantial communication between said chamber and the outside atmosphere, whereby said container is open when said first and second housing members are in said second position, said second housing member including a post extending through said chamber and into said aperture in said first



housing member, said post being sized and shaped so as to be engageable by one finger of an operator and said post cooperating with said aperture and said first housing member to form means for allowing a force applied in one direction to said post by one finger of an operator to cooperate with a force applied in an opposite direction to said first housing member by no more than the other four fingers on the same hand of an operator so as to cause the relative movement of said second housing member away from said first housing member as said first and second housing members are moved from said first position to said second position, whereby an operator may open said container using one hand only.

4,549,694

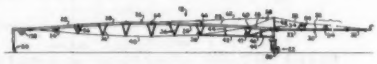
CORNER WATERING SYSTEM FOR CENTER PIVOT IRRIGATION MACHINES

John E. Davis, Hebron, Nebr. 68370; Terry L. Zielke, Deshler, Nebr. 68340, and Ronald J. Coash, Hebron, Nebr. 68370

Division of Ser. No. 363,275, Mar. 29, 1983,. This application Nov. 14, 1983, Ser. No. 551,307

Int. Cl.[4] B05B *3/02*

U.S. Cl. 239—710 **2 Claims**



1. In a center pivot irrigation machine having a main boom supported to pivot about one end, an extension boom pivotally coupled with the opposite end of the main boom, a support tower for said extension boom having steerable wheels for pivotally extending and retracting the extension boom relative to the main boom, a water conduit forming the span of the extension boom between the main boom and the support tower, and a cantilever end boom section forming the portion of the extension boom extending beyond the support tower, a truss structure for said extension boom comprising:

a mast extending generally upwardly from the extension boom at a location adjacent the support tower, said mast having a top portion above the extension boom terminating in opposite ends located on opposite sides of the extension boom;

a first pair of chords respectively connected at one end to the opposite ends of said top portion of the mast and at the other end to said end boom section adjacent the outer end thereof to provide support for said end boom section;

a plurality of web members spaced apart along the length of said end boom section and extending between each chord

and said end boom section to cooperate with said chords in a manner to maintain the end boom section in a substantially straight condition when loaded with water, said web members being arranged to maintain each chord in the shape of a segmented curve when the end boom is loaded with water; and

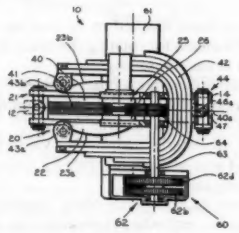
a second pair of chords respectively connected at one end to the opposite ends of said top portion of the mast and at the other end to said water conduit at a preselected location thereon, said preselected location being chosen such that when the water conduit and end boom are loaded with water, the bending moments applied to said preselected location by said water conduit and end boom are substantially equal and opposite to cancel one another and provide a point of zero moment at said preselcted location.

4,549,695

THRUST VECTOR CONTROL ACTUATOR

James T. Sears, Boulder, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed Jul. 29, 1983, Ser. No. 518,564
Int. Cl.[4] F02K *9/84*
U.S. Cl. 239—265.35 **5 Claims**



3. A system for directing the nozzle of a rocket, comprising:

a frame,

an electric motor drive, and

a driven member connected with the rocket nozzle, said driven member being movably carried by the frame and driven by the electric motor drive, said frame and driven member including means adapted to interact and to provide a force counteracting the force imposed on the driven member by the rocket nozzle when it is displaced by the electric motor drive.

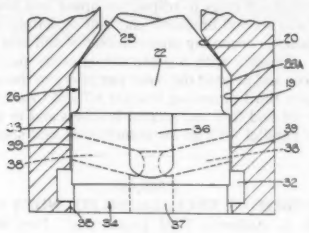
4,549,696

FUEL INJECTION NOZZLES

David J. Gaskell, Upper Stanstead, England, assignor to Lucas Industries, p.l.c., Birmingham, England

Filed Jun. 29, 1984, Ser. No. 626,240
Claims priority, application United Kingdom, Jul. 16, 1983, 8319286
Int. Cl.[4] B05B *1/12;* **F02M** *61/18*
U.S. Cl. 239—452 **3 Claims**

1. A fuel injection nozzle for supplying fuel to an internal combustion engine, the nozzle being of the so-called outwardly opening type and comprising a hollow body part, a valve assembly including a resiliently loaded valve member and a seating, the valve assembly being located within the body part with a valve head forming part of the assembly being exposed at one end of the body part but being located in a pocket therein downstream of the seating and a fuel inlet communicating with the interior of the body part, said pocket having a right cylindrical wall, a circumferential groove formed in said wall at a position spaced from the end of the wall remote from the seating, said valve head defining a first portion adjacent the contact region of the head with the seating, said first portion defining with the wall of the pocket a space to which fuel is supplied when the head is lifted from the seating, the valve head defining a second portion of right cylindrical form adjacent said first portion, said second portion having a working clearance with the wall of the pocket, the valve head defining a third portion which defines with said wall of the pocket a first outlet, means for conveying fuel from said space to said groove, a second outlet formed in the valve head and passage means in said head connecting said second outlet to a control port formed in said second portion of the head, said control



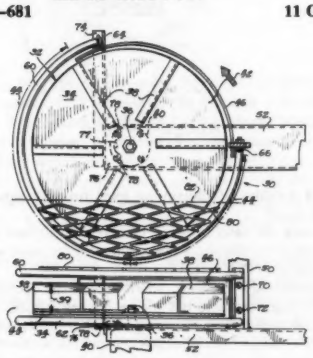
port being positioned so that the initial flow of fuel upon movement of the valve head away from the seating takes place from said groove through the first outlet to provide a fuel spray of low penetration, and as the valve head continues to move away from the seating, flow of fuel will take place from said groove through the control port and the second outlet to produce a spray pattern of increased penetration, the flow of fuel through said first outlet diminishing as the valve head moves to its fully opened position.

4,549,697

SPREADER GUARD

Kenneth P. Manon, Lindenwood, Ill., assignor to Swenson Spreader Company, Lindenwood, Ill.

Filed Jun. 9, 1983, Ser. No. 502,493
Int. Cl.[4] A01C *17/00*
U.S. Cl. 239—681 **11 Claims**



1. A guard apparatus for rotatable, lateral discharge, solid material distribution spinner having an axis and a given circumference and given height defining a lateral discharge area, said guard apparatus comprising: an upper ground ring and a lower guard ring each defining an outer periphery at least as great as the circumference of said spinner; coupling means for coupling the upper and lower guard rings together in assembled condition and in parallel planes, spaced apart by an amount at least as great as said given height of said spinner; and mounting means for mounting the assembled guard rings and coupling means with said coupling means in a predetermined alignment and with the guard rings oriented in planes respectively above

and below the spinner so as to respectively overlie the outer circumference thereof while leaving the lateral discharge area thereof unobstructed; said coupling means comprising substantially identical first and second brackets, each of a length greater than the height of said spinner, said brackets being alignable by said mounting means in said predetermined alignment comprising an alignment wherein respective ends thereof extend at least beyond upper and lower axial extremities of said spinner, and means for affixing respective ends of said upper and lower guard rings to respective upper and lower parts of the first and second brackets; and said mounting means comprising fastener receiving means in one of said first and second brackets alignable with a plane substantially parallel to said spinner axis and beyond the outer periphery of the spinner, and an elongate third mounting bracket affixed to a lower end of the other of said first and second brackets and in a plane substantially parallel with an undersurface of said spinner.

4,549,698

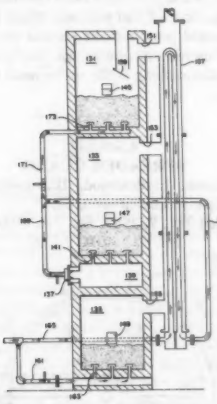
METHOD OF RECLAIMING FOUNDRY SAND

Robert S. L. Andrews, 7712 Incline Ter., Fort Worth, Tex. 76179

Division of Ser. No. 346,235, Feb. 5, 1982, Pat. No. 4,508,277, Continuation-in-part of Ser. No. 185,206, Sep. 8, 1980, abandoned. This application Nov. 26, 1984, Ser. No. 674,595

Int. Cl.[4] B02C *19/12, 23/38*

U.S. Cl. 241—17 **3 Claims**



1. A method of reclaiming used foundry sand, comprising the steps of:

passing the sand to be reclaimed to a preheat chamber having sidewalls and a floor, wherein the sand is heated in the range of 700°–900° F.;

continuously passing sand from the preheat chamber through an external chute having a continuously open passageway to a calcining chamber having sidewalls and a floor and which is located below the preheat chamber, the temperature of the sand in the calcining chamber being maintained in the range of 1400°–1800° F.;

continuously passing sand from the calcining chamber through an external chute having a continuously open passageway to a cooling chamber having sidewalls and a floor and which is located below the calcining chamber, the temperature of the sand in the cooling chamber being maintained in the range of 700°–900° F.;

introducing hot gases from a firebox into the calcining chamber through vent means provided in the floor of the calcining chamber;

introducing air from a blower unit into vent means provided in the floors of the preheat and cooling chambers for passing air upwardly through the preheat and cooling chambers, whereby sand is moved through the external passageways successively downwardly between the preheat, calcining and cooling chambers; and

removing reclaimed sand from the cooling chamber.

4,549,699

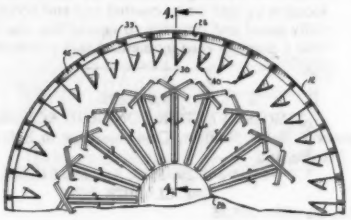
FLIGHTING FOR HORIZONTAL DRYERS

Stanley P. Thompson, P.O. Box 8203, Topeka, Kans. 66608

Filed Sep. 26, 1983, Ser. No. 535,572

Int. Cl.[4] B02C *17/10*

U.S. Cl. 241—91 **8 Claims**



1. A drying drum adapted to be coupled with: (A) a heat source and (B) means for rotating the drum about its longitudinal axis, said drum comprising:

an elongated hollow body characterized by an inner surface of generally circular vertical cross section and having a material inlet and a material outlet;

a plurality of material distributing vanes coupled with the body and spaced circumferentially around and longitudinally along said surface,

at least some of said vanes being characterized by a first planar surface extending from said inner surface in a direction generally transverse to a tangent to said body, said first planar surface presenting a material receiving area for holding the material being dried and carrying it partially around the perimeter of said body;

said vanes having said first planar surface also being characterized by a second planar surface of wedge-shaped configuration which intersects said first surface at an angle of about 90° to 150°, said second planar surface being positioned to receive material from said first planar surface and deposit said material into the interior of said body, that portion of the material received by the narrow end of said wedge-shaped planar surface gravitating therefrom ahead of the material received by the wide end of said wedge-shaped surface; and

a plurality of circumferentially spaced interference structures coupled with said drum at a location spaced radially inward from said material distributing vanes and spaced longitudinally along the length of the drum,

whereby material being dried in said drum will be deposited on said vanes as the drum rotates and will gravitate along said first and second surfaces, said material at the narrow end of said wedge-shaped surface falling from a vane ahead of material at the opposite end of the same surface.

4,549,700

APPARATUS FOR CROPPING AND INSPECTING A SHEET-METAL COIL

Horst Ganséuer, Kreuztal, Fed. Rep. of Germany, assignor to Siemag Transplan GmbH, Netphen, Fed. Rep. of Germany

Filed Dec. 20, 1983, Ser. No. 563,694

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1982, 3247705

Int. Cl.[4] B65H *19/20;* **B21C** *47/16*

U.S. Cl. 242—56 R **9 Claims**

1. An apparatus for cropping and inspecting the end of a coil of sheet metal, the apparatus comprising:

a cradle dimensioned and oriented to support the coil with its axis horizontal;

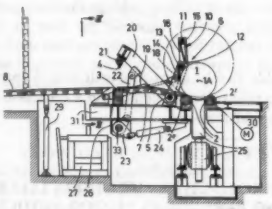
winding means for rotating the coil on the cradle about a horizontal cradle axis;

a stationary lower blade spaced horizontally from the cradle;

a roller-type conveyor extending horizontally from the cradle to the lower blade;

an upper blade pivotal disposed above said lower blade; arm means carrying said upper blade for mounting same to pivot about a horizontal blade axis toward and away from the lower blade;

cutter means connected to the upper blade for pivoting same down against the lower blade and thereby severing sheet metal between the blades;



an opening element pivotal about an opening axis toward and away from the coil on the cradle;

opening means independent of the cutter means and connected to the opening element for pivoting same between an inner position radially engaging the coil on the cradle and an outer position immediately adjacent the conveyor, whereby when the coil is rotated about the cradle axis in a direction to unwind it, and the opening element is displaced from the inner to the outer position, the sheet-metal of the coil is unwound and laid on the conveyor, the opening and cutter axes being generally level with the lower blade, lying between the lower blade and the cradle, and being closer to the cradle than to the lower blade.

4,549,701

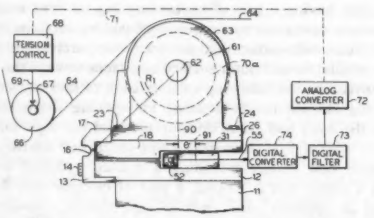
WEB TENSION LOAD CELL

Robert G. Lucas, Janesville, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Dec. 16, 1983, Ser. No. 562,005

Int. Cl.[4] B65H *23/16*

U.S. Cl. 242—75.3 **4 Claims**



1. Apparatus for controlling tension in a winder for paper or other web comprising, a first roller in engagement with said web to measure vertical loads, a first bearing support means rotatably supporting said first roller and formed with a horizontal surface, a base member formed with a horizontal surface, a first flexible support means having a first horizontal leg mounted to the horizontal surface of said base member and said first flexible support means having a second horizontal leg and said horizontal surface of said first bearing support means connected to said second horizontal leg, a first strain gauge load cell with one side mounted on said first horizontal leg of said first flexible support means and with its other side in contact with said second horizontal leg so as to measure vertical loads on said roller, and said first and second legs joined together by a flexible portion which has a reduced cross-section so as to allow flexure of said first and second legs, wherein said central portion has a reduced cross-section which has an opening which is semi-cylindrical in shape, wherein said load cell produces an electrical output and an infinitely variable tension control means engages said web and receives the electrical output of said load cell.

4,549,702

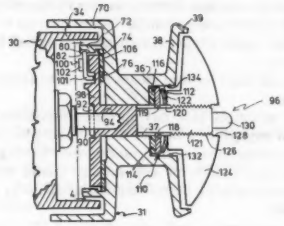
DRAG FOR SPINNING REEL

Richard R. Councilman, Collinsville, Okla., assignor to Brunswick Corporation, Skokie, Ill.

Continuation of Ser. No. 400,966, Jul. 22, 1982, abandoned. This application Aug. 29, 1984, Ser. No. 645,529

Int. Cl.[4] A01K *89/01*

U.S. Cl. 242—84.51 A **12 Claims**



1. In a fishing reel having a housing, an axially reciprocable, non-rotatable center shaft carried by the housing, a line spool carried by the center shaft and having a line storage pocket on which the line is wound, which spool during casting is non-rotating and from which fishing line is unwound in a substantially axial direction, by transmission means to the hand crank to be rotated thereby and bail means pivotally mounted on the support member to rotated therewith, the improvement comprising:

means for applying drag to the line spool comprising first drag means, second drag means radially offset and axially separated from the first drag means, and drag adjusting knob means, the first drag means being planar and having inner and outer diameters, the outer diameter extending radially outward of the storage pocket, the first drag means being mounted on one side of the line spool between one planar axial face of the line spool extending radially outward of the storage pocket and a flange member carried by the center shaft, the second drag means having an outer diameter smaller than the inner diameter of the first drag means and being mounted on the other side of the line spool between a second axial face of the line spool disposed radially inward of the storage pocket and the drag adjusting knob means, the knob means being carried by the center shaft and being axially adjustable along the center shaft for increasing and decreasing the drag applied by the first and second drag means to the line spool.

4,549,703

DEVICE FOR PREVENTING BACKLASH ON SPOOL OF FISHING REEL

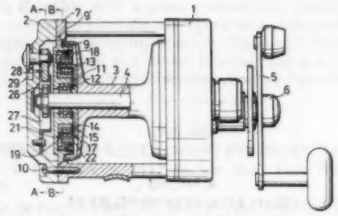
Takashi Atobe, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Higashi-Kurume, Japan

Filed Mar. 15, 1983, Ser. No. 475,704

Claims priority, application Japan, Mar. 19, 1982, 57-39060[U]

Int. Cl.⁴ A01K *89/02*; **F16D** *63/00*

U.S. Cl. 242—84.52 B **6 Claims**



1. In a double shaft support fishing reel having provisions for preventing spool backlash:

(a) first and second side frame members;

(b) strut means securing at opposite ends thereof, said side frame members to define a cage for a spool;

(c) first and second side plates detachably secured to the first and second side frame members respectively;

(d) a spool having a shaft;

(e) first spool shaft support means carried by said first side plate;

(f) spool shaft driving means accommodated in said first side plate;

(g) a mounting disc having a peripheral rim fitted between and engaging both said second side plate and said second frame member, said mounting disc having means registering said disc with said second frame member, said rim being confined to its fitted relationship by said second side plate;

(h) second spool shaft support means fitted to said mounting disc whereby the transverse bearing load of spool shaft is transmitted directly to said second frame member through said registering means, said transverse bearing load thereby bypassing said second side plate, said first and second shaft support means being aligned and together defining an axis of rotation of said spool shaft;

(i) magnetic field forming means carried entirely by said mounting disc and detachable therewith, said magnetic field forming means being directly opposed to the corresponding end of said spool; and

(j) an electrically conductive annular eddy current member carried by said spool and projecting into the magnetic field formed by said magnetic field forming means whereby a magnetic drag is imposed upon said spool as a function of its rotational speed.

4,549,704

COUPLING DEVICE FOR THE WINDING SHAFT OF A SAFETY BELT ROLL-UP DEVICE WITH RETIGHTENING DEVICE

Artur Föhl, Auf der Halde, Fed. Rep. of Germany, assignor to Repa Feinstanzwerk GmbH, Schorndorf, Fed. Rep. of Germany

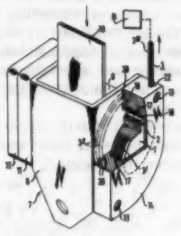
Filed Aug. 25, 1983, Ser. No. 526,558

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1982, 3231807

Int. Cl.⁴ A62B *35/02*; **B65H** *75/48*

U.S. Cl. 242—107 **22 Claims**

18. An apparatus for tightening a safety belt, said apparatus comprising a rotatable member around which the safety belt is wound, a roll connected to said member for rotation therewith, a flexible cable wrapped around said roll, and means to move said cable from a first condition in which said member and roll are freely rotatable relative to said cable to a second condition



in which said cable firmly grips said roll and is movable to impart rotation to said roll and member in a direction to wind the safety belt on said member.

4,549,705

SAFETY BELT ROLL-UP DEVICE, ESPECIALLY FOR PROTECTING PERSONS IN MOTOR VEHICLES

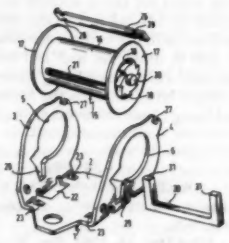
Arthur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to Repa Feinstanzwerk GmbH, Aldorf, Fed. Rep. of Germany

Filed Oct. 25, 1983, Ser. No. 545,058

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1982, 3239584

Int. Cl.⁴ A62B *35/02*; **B65H** *75/48*

U.S. Cl. 242—107.4 R **1 Claim**



1. A safety belt roll-up device for use in a motor vehicle, said device comprising a one-piece U-shaped frame formed of sheet metal and having a pair of upstanding leg sections interconnected by a connector section, each of said leg sections including an outer side surface and an inner side surface which extends parallel to said outer surface and faces toward the inner side surface on the other leg section, each of said leg sections including surface means defining an opening extending between the inner and outer side surfaces and having a circular portion with a first diameter, a one-piece belt carrier, said one-piece belt carrier including a roll-up cylinder around which a safety belt is wound, a pair of circular reel flanges located at opposite axial ends of said roll-up cylinder and having diameters which are greater than the diameter of said roll-up cylinder and said first diameter, a pair of circular positioning shoulders projecting axially outwardly from said reel flanges and having diameters which are greater than said first diameter and less than the diameter of said reel flanges, a pair of circular arrays of ratchet teeth projecting axially outwardly from said positioning shoulders and having a diameter which is less than said first diameter, and a pair of cylindrical bearing sections projecting axially outwardly from said circular arrays of ratchet teeth and having diameters which are less than the diameters of said circular arrays of ratchet teeth, said position-

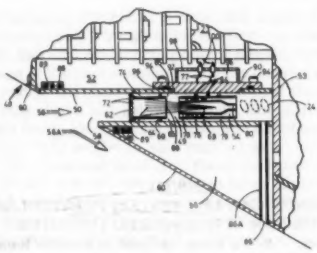
ing shoulders being disposed in abutting engagement with said inner side surfaces of said leg sections of said frame, said circular arrays of ratchet teeth being disposed in said openings in said leg sections of said frame with at least a major portion of the axial extent of each of said circular arrays of ratchet teeth being disposed between the inner and outer side surfaces of said leg sections, a pair of support means disposed adjacent to the outer side surfaces of said leg sections of said frame for engaging said bearing sections and supporting said one-piece belt carrier for rotation about the central axis of said roll-up cylinder, and pawl means for engaging said circular arrays of ratchet teeth and blocking rotation of said one-piece belt carrier in a safety belt unwinding direction, said pawl means including a pair of blocking surface means at least partially disposed in said openings in said leg sections and being movable along paths extending parallel to the inner and outer side surfaces of said leg sections between disengaged positions spaced from said circular arrays of ratchet teeth and engaged positions engaging said circular arrays of teeth to block rotation of said one-piece belt carrier.

4,549,706

FLOW DATA SENSOR DUCT SYSTEM

Truman M. Stickney, Bloomington, Minn., assignor to Rosemount Inc., Eden Praire, Minn.

Filed Jun. 1, 1983, Ser. No. 499,863
Int. Cl.⁴ B64D *43/00*
U.S. Cl. 244—1 R **20 Claims**



1. For use in an air vehicle including an air vehicle component forming a portion of the air vehicle structure and being other than an air data sensor protruding from the air vehicle external surface, the component having an external surface, a portion of which external surface is exposed to a free stream flow, the improvement comprising non-intrusive duct system means within the external surface boundries of the air vehicle component for conveying a portion of such free stream flow and a flow data sensor suitably disposed with respect to the duct system means within the external surface boundries of the air vehicle component to sense a parameter of such portion of free stream flow, the duct system means comprising:

conduit means having an opening through the external surface to the free stream flow for receiving a portion of flow therefrom and the means defining the opening being substantially flush with the position of the external surface of the air vehicle component which is exposed to the free stream flow and for directing such portion of flow to affect the flow data sensor such that the portion of flow bears a known relationship to the flow parameter to be sensed as it exists in free stream flow,

flow control means comprising nozzle means disposed in the duct system means for controlling the portion of free stream flow in the conduit means so that such portion of free stream flow is compatible with the sensing capabilities of the flow data sensor throughout the range of rates of free stream flow over which sensing of a parameter thereof is desired; and

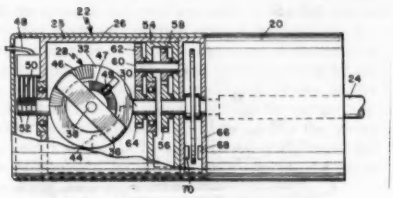
boundary layer control means disposed in the nozzle means for bleeding off boundary layer flow such that the boundary layer flow does not affect the flow data sensor, the boundary layer flow consisting of the layer of the portion of free stream flow in the conduit means that is proximate to the conduit means and affected thereby.

4,549,707

TORQUE OPTIMIZING NEUTRAL INERTIA DEVICE

Anthony Daukas, Laguna Beach, Calif., assignor to General Dynamics Pomona Division, Pomona, Calif.

Filed Dec. 27, 1982, Ser. No. 453,842
Int. Cl.⁴ F42B *15/02*
U.S. Cl. 244—3.21 **18 Claims**



1. Air frame control system including:

a variable pitch control surface,

first control means comprising a rotary servo motor for controlling the pitch of said control surface, and

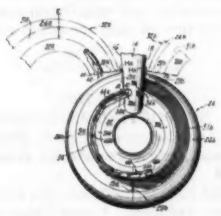
second control means comprising a variable inertia rotor for controlling the inertial reaction of said control surface.

4,549,708

COWLING LATCH SYSTEM

James R. Norris, Bolton, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 31, 1982, Ser. No. 413,580
Int. Cl.⁴ B64D *29/06, 29/08*
U.S. Cl. 244—129.4 **12 Claims**



1. A latch system for the nacelle of a gas turbine engine having a cowling which includes at least one door attached by a hinge joint along a portion of the door to a support structure for the engine, which comprises:

a cable for exerting a force in a first direction as a result of tension in the cable;

a coupling which is attached to the cable and which extends between the cowling and the support structure for attaching the cowling to the support structure, the coupling having a first member and having a second member which is attached to the cable and which is translatable in the first direction in response to a force exerted by said cable, the coupling being movable in response to a first level of tension in said cable to a locked position which attaches the cowling to the support structure and being movable in response to a second level of tension in said cable to an unlocked position which does not attach the coupling to the support structure; and

a means spaced from the coupling for applying tension to the cable.

4,549,709

DEVICE FOR ATTACHING TO A WALL THE END OF A SHEATH IN WHICH A CONTROL CABLE IS SLIDABLY RECEIVED

Jean Deligny, Le Mans, France, assignor to Societe Anonyme DBA, Paris, France

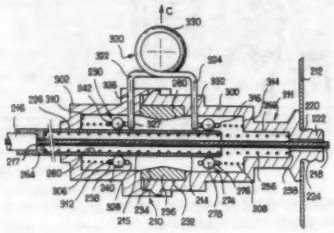
Filed Feb. 18, 1982, Ser. No. 349,889

Claims priority, application France, Feb. 27, 1981, 81 03947

The portion of the term of this patent subsequent to Dec. 20, 2000, has been disclaimed.

Int. Cl.⁴ F16L *5/00*

U.S. Cl. 248—56 **19 Claims**



1. A device for attaching to a stationary wall having a wall aperture, an end of a sheath of a mechanical actuating mechanism including a cable axially slidable within said sheath and having one end portion of the cable extending from said sheath end and through said wall aperture, said device comprising:

a sheath end fitting of substantially cylindrical shape associated with said sheath end, having one end designed to be mounted in said wall aperture and having an inner bore within which is slidably received said sheath end;

an adjustment spring disposed between said sheath end fitting and said sheath end for urging said sheath end in a direction away from said wall; and

manually actuable locking means within said sheath end fitting cooperating with said sheath end to prevent axial displacement thereof with respect to said sheath end fitting.

4,549,710

SUPPORTING ASSEMBLY

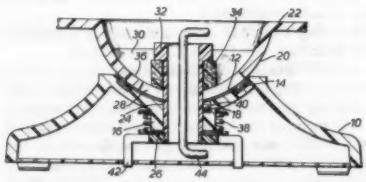
Dennis Prince, Long Eaton, and Eric C. Douglas, Broadstone, both of England, assignors to Plessey Overseas Limited, Ilford, England

Filed Feb. 23, 1983, Ser. No. 469,121

Claims priority, application United Kingdom, Feb. 26, 1982, 8205796

Int. Cl.⁴ F16M *11/12*

U.S. Cl. 248—183 **6 Claims**



1. A supporting assembly comprising:

a base member and a supporting member, said base member having a spherically shaped depression formed therein, said supporting member having a sphericaly shaped projection with substantially the same radius of curvature as said depression, said projection being mounted inside said depression and defining an elongated slot,

a pillar extending through said slot and radially through said depression and being rotatable relative thereto,

means coupling said projection and said pillar for rotation together,

first and second friction members, each comprising a dry fibrous material,

said first friction member being mounted between said depression and said projection and acting on the outer surface of said projection to allow motion of said projection relative to said depression and to maintain said projection in repose in a set position relative to said depression,

said second friction member being mounted on said pillar and pressing on the internal surface of said projection to allow motion of said pillar relative to said projection and to maintain said pillar in repose in a set position relative to said projection, so that said supporting member is tiltable in the plane containing the axis of said elongated slot against said first friction member and said second friction member and is rotatable relative to said base member about the axis of the pillar, and

spring means biasing the pillar relative to the projection and the depression to cause the first friction member to press against said outer surface of said projection and the second friction member to press against said internal surface of said projection to apply a preset degree of friction thereto.

4,549,711

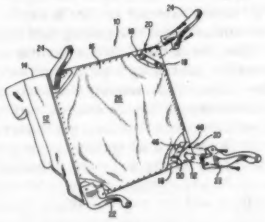
NON-CYLINDRICAL LEG SYSTEM PARTICULARLY USEFUL FOR UPHOLSTERED FURNITURE

Robert Giltnane, Athens, Tenn., assignor to Plastics Industries, Inc., Athens, Tenn.

Filed Dec. 7, 1983, Ser. No. 558,900

Int. Cl.⁴ F16M *11/16*

U.S. Cl. 248—188 **14 Claims**



1. In an upholstered seating furniture comprising at least a frame, seat and back, a corner block attached to said frame at least at the front corners thereof, a non-cylindrical leg for each corner block, a flat surface forming the entire upper end of each said leg, and upstanding pins secured to the flat upper surface of each leg, each said corner block bored to receive at least said upstanding leg pin, and a pair of screws, bores in the upper end of each leg corresponding in position and diameter to the pair of bores in the corner block, and wherein the frame comprises wood and the corner blocks comprise plastic; and wherein the pair of screws pass through the bores in the corner blocks into the wood frame.

4,549,712

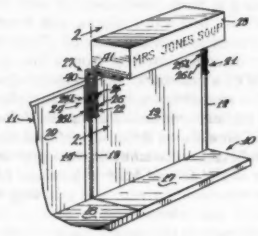
APPARATUS FOR MOUNTING A DEVICE ON A SLOTTED POST

Virgil S. Simon, Glenview; Arthur C. Gutowsky, Buffalo Grove, and Nestor T. Haluzak, Morton Grove, all of Ill., assignors to Thomas A. Schutz Co., Inc., Morton Grove, Ill.

Filed Jun. 1, 1982, Ser. No. 384,016

Int. Cl.⁴ F16M *13/00*

U.S. Cl. 248—224.4 **7 Claims**



7. A fitting of which a pair may be used to mount a device supporting bracket on one of a pair of upright hollow posts which have abutting first sides and coplanar second sides, and there being a vertical line of spaced, longitudinal slots in each of said second sides with each slot in one of said lines being coplanar with a slot in the other of said lines, said fitting comprising:

a post engaging element of a shape and thickness to be inserted edgewise through a slot in a first one of said pair of posts, said element including a neck adapted to rest on the bottom of the post slot into which the element is inserted, and ears in the plane of the neck to engage the interior of the post above and below said post slot to retain an inserted fitting loosely on the post, and an integral upright web at right angles to said neck so as to extend transversely across and parallel to the second side of said first one of said pair of posts, said web being devoid of means which would interfere with a separate fitting inserted in the coplanar slot of a second one of said pair of posts, a side web perpendicular to the integral web and an outer web parallel to the integral web so as to define a laterally open channel, and said integral web and said outer web having fastener holes aligned with one another to receive a fastener for securing in said laterally open channel a mounting arm of a device supporting bracket that is provided with means which engages said second side of the post to lock the inserted fitting to the post.

4,549,713

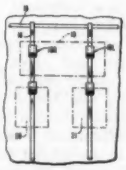
VERTICALLY ADJUSTABLE HANGERS FOR PICTURES, AND THE LIKE

Charles R. Magadini, 6024 N. 20th St., Phoenix, Ariz. 85016

Filed Oct. 28, 1983, Ser. No. 546,477

Int. Cl.⁴ A47G *1/24*

U.S. Cl. 248—495 **6 Claims**



1. A vertically positionable hanger bracket assembly for holding an object in a vertical position along a vertically oriented rod, comprising in combination,

a rigid hanger strap formed as a substantially planar sheet having a positioning leg portion with a rod receiving aperture therethrough and an integral hanger portion extending therefrom at an angle to provide a hanging hook for receiving an object thereon, said rod receiving aperture being of a size to cooperatively engage a rod of a slightly smaller outer dimension so that the strap may be oriented with the hanger portion lowermost to cause the aperture to eccentrically engage and lock the hanger strap against the rod to prevent downward vertical movement when the hanger portion is held downwardly, such as by a weight,

and a sheet spring locking member disposed generally parallel to the positioning leg portion and fastened thereto to extend from a position near the hanger portion toward the aperture, said spring being disposed at least partly over said aperture so that when the aperture is positioned along the rod the spring is deflected and rides on the rod in such manner that the hanger portion extends downwardly and is locked in place by eccentric engagement of the aperture against the rod, as biased into the locked position by the spring to prevent downward movement of the hanger strap along the rod, and thereby permits the hanger portion to be manually forced upwardly against the spring bias to unlock the eccentric aperture-rod engagement and permit the hanger to be vertically moved along the rod to a desired new locking position.

4,549,714

ROTATABLE STAND

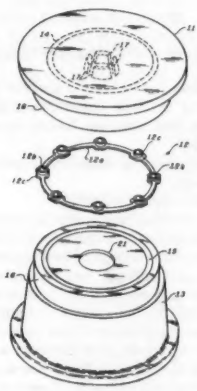
Erwin Busch, Arolsen, Fed. Rep. of Germany, assignor to Thermohauser Erwin Busch GmbH, Uhingen, Fed. Rep. of Germany

Filed Oct. 13, 1983, Ser. No. 541,586

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1982, 3246835

Int. Cl.⁴ A47B *91/00*

U.S. Cl. 248—349 **4 Claims**



1. A rotatable stand comprising:

a base having a centered circular aperature through a top surface and a first circular grove on said top surface, said grove having a predetermined radius and a radius of curvature in cross section:

a plurality of ball bearings coupled in a ring of radius equal to said predetermined radius, each of said ball bearings positionable in said first circular grove and having a radius equal to said radius of curvature;

a tray having a second circular grove on an underside thereof, said grove having a radius equal to said predetermined radius and a cross section of radius equal to said radius of curvature, said tray removably positionable on said plurality of ball bearings such that said first and sec-

ond groves form a race for said ball bearings, thereby allowing for rotation of said tray; and

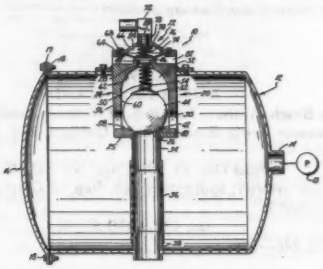
a plurality of tabs circularly positioned and having a continuous crossectional contour, extending, at a preselected flare angle from a perpendicular to said underside, through said aperture of said top surface of said base, said tabs having a length and flare angle for each tab such that end sections of said tabs lie on arcs of a circle having a diameter greater than said selected diameter of said aperture, whereby said tray rotates freely on said ball bearings with no movement transverse to said rotation axis of said tray and said tray does not tilt when subjected to an off center load.

4,549,715

APPARATUS FOR PROVIDING A GASEOUS PRESSURE PULSE

Mark R. Engel, Apple Valley, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.

Filed Aug. 11, 1983, Ser. No. 522,348
Int. Cl.[4] F16K *31/02*
U.S. Cl. 251—29 **2 Claims**



1. Apparatus for providing a gaseous pressure pulse, comprising:

a first container for holding a gaseous fluid, said first container being in fluid communication with pressurizing means, said first container having an exit passage for said gaseous fluid;

first and second valve means for controlling flow of said gaseous fluid;

said first valve means including:

a second container surrounded by said first container, said second container including a cylindrical wall with an hemispherical end and an end opposite said hemispherical end, said opposite end having a first exit port connected to said exit passage, said first exit port having a first inside diameter, said cylindrical wall having a second inside diameter larger than the first inside diameter, said first exit port defining a plane, said second container further including a second exit port located in the hemispheral end of said second container, said first and second exit ports being centered on the axis of the cylindrical wall, said second container enclosing a first portion adjacent to the end opposite said hemispherical end and a second portion adjacent to said hemispherical end, said cylindrical wall having a region adjacent to the end opposite said hemispherical end, said region having an opening therein;

a spherical ball within said second container, said ball having a third diameter, said third diameter being smaller than said second diameter, said ball having a point nearest the plane defined by said first exit port, said point being separated from the plane defined by said first exit port by a distance of at least seventy five percent of the first inside diameter of said first exit port when said ball is positioned against said hemispherical end, the opening in said region arranged to be in constant fluid communication with said second exit port;

means for biasing said ball against said first exit port; and

said second valve means including:

a walled enclosure with third, fourth and fifth ports for fluid passage therethrough;

a closure element for controllably separating said third and fourth ports;

means for biasing said element to close said third port and separate said third port from said fifth port, said third port being in fluid communication with the second exit port of said first valve means, said fourth port being open to ambient pressure external of said first container;

means for bleeding said fluid from a first space bordered partially by a first side of said element adjacent the third port to a second space bordered partially by a second side of said element and said walled enclosure to equalize fluid pressure on both sides of said element;

means for relieving over-ambient fluid pressure in the second space of said second valve means, said fifth port being in fluid communication with said relieving means;

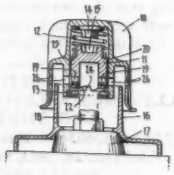
whereby when said relieving means relieves the over-ambient fluid pressure in the second space of said second valve means, said closure element moves to place said third and fourth ports in fluid communication and the over-ambient pressurized fluid in the second portion of said second container between said ball and said hemispherical end is relieved therethrough to ambient, the pressurized fluid entering the opening in said region of said cylindrical wall then forcing said ball into the second portion of said second container against said hemispheric end and thereby opening the interior of said first container to fluid communication with said exit passage through the opening in said second container.

4,549,716

CONTROL HANDLE ARRANGEMENT FOR A FLUID CONTROL VALVE

Timothy P. Warren, 3 Erica St., Canterbury, Victoria 3126, Australia

Filed Dec. 15, 1983, Ser. No. 561,659
Int. Cl.[4] F16K *35/02*
U.S. Cl. 251—96 **7 Claims**



1. A control handle arrangement for a water tap with a fluid control valve of the kind having an operating spindle adapted for rotation in first and second opposite directions to respectively close and open said valve, said handle arrangement including a handle, spindle engaging means mounted on said spindle for mounting said handle on said spindle for axial movement of the handle thereon relative to said spindle between a normal position and a moved position, first drive means engageable, in the normal position of said handle, between said handle and said spindle engaging means for rotational driving of said spindle solely in said first direction, in response to rotation of said handle, to close said valve, said handle, in the normal position, allowing movement of said handle in the opposite direction independently of said spindle without affecting the position of said valve, and second drive means, in the moved position of said handle, between said

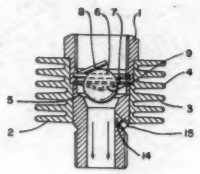
handle and said spindle engaging means for rotational driving of said spindle in said second direction, upon rotation of said handle, to open said valve while simultaneously disengaging said first drive means between said handle and said spindle.

4,549,717

HEAT RESPONSIVE VALVE

Gabriël Dewaegheneire, Zwevegem, Belgium, assignor to Leuven Research & Development, Louvain, Belgium

Filed Feb. 23, 1984, Ser. No. 582,720
Claims priority, application Luxembourg, Mar. 7, 1983, 84677
Int. Cl.[4] F16K *35/00, 17/38*
U.S. Cl. 251—111 **20 Claims**



1. A valve responsive to the temperature of the surrounding medium, comprising:

(a) a generally tubular body having a passageway therethrough and said body comprised of a heat conducting material and being adapted for connection to fluid supply means;

(b) a valve seat disposed in said passageway;

(c) obturation means disposed in said passageway and being movable between an open position spaced from said seat permitting fluid flow through said passageway and a closed position engaged with said seat preventing fluid flow through said passageway;

(d) shape memory element means having first and second temperature induced shapes disposed within said passageway and having a portion fixed to the wall of said passageway so that the temperature of the medium surrounding said body is thermally conducted to said shape memory element means for heating said shape memory element means to a temperature associated with the temperature of the medium surrounding said body;

(e) said shape memory element means assuming said first shape when the temperature of said shape memory element means is less than a preselected temperature and said first shape permitting said obturation means to be disposed in one of said open and closed positions;

(f) said shape memory element means assuming said second shape when the temperature of said shape element means exceeds a preselected temperature and said shape memory element means having a portion engagable with said obturation means for moving said obturation means to the other one of said open and closed positions when said second shape is assumed; and,

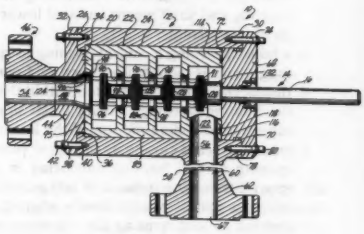
(g) spring means including cooperating arcuate portions engaged with said obturation means for maintaining said obturation means in said open and closed positions whereby movement of said obturation means from one of said positions causes said arcuate portions to flex and to thereby permit movement to the other one of said positions and to therein be retained.

4,549,718

LOW NOISE VALVE

Fritz O. Seger, Mission Viejo, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed May 7, 1984, Ser. No. 607,521
Int. Cl.[4] F16K *47/04*
U.S. Cl. 251—121 **9 Claims**



1. A low noise valve comprising:

a body having a fluid inlet and a passageway extending from the inlet to a fluid outlet, the body including a plurality of throats serially disposed in the passageway; and

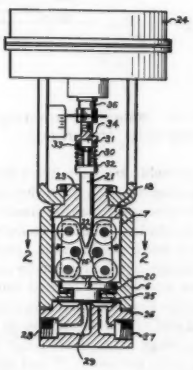
a valve stem movable between a first position wherein a plug having a plurality of outer alternating grooves and lands is positioned within each throat to define a plurality of annular flow restrictions between the throat and the plug lands to restrict fluid flow from the inlet to the outlet and a selected second position wherein at least one land of each plug is disposed without the throat to reduce the number of annular flow restrictions restricting fluid flow.

4,549,719

MECHANICAL AMPLIFYING MEANS FOR VALVES AND OTHER DEVICES

Hans D. Baumann, 32 Pine St., Rye, N.H. 03870

Filed Feb. 2, 1984, Ser. No. 576,362
Int. Cl.[4] F16K *31/44*
U.S. Cl. 251—280 **5 Claims**



1. Mechanical amplifying means for valves and other devices comprising:

a. one pair of identical toggle elements mounted in spaced relationship between a pair of opposed parallel outer plates whose upper terminating surfaces extend above the upper extremity of said pair of toggle elements and whose lower terminating surfaces are shortened in relationship to the lower extremity of said toggle elements. each of said

toggle elements pivotably supported by shaft means which are suitably retained within said pair of outer plates;

b. each of said toggle elements comprising one or more upper bearings suitably supported above said shaft means and between a pair of opposed parallel inner plates, and one or more lower bearings suitably rotatably supported below said shaft means and between the same pair of inner plates whose outer periphery does not exceed that of the bearings, the geometric relationship between said upper bearing, said shaft means and said lower bearing is that of an obtuse triangle;

c. a housing having a central opening to receive said pair of toggle means mounted between said pair of outer plates;

d. displacement means mounted within the lower portion of the housing opening, having a flat upper surface being subjected to rolling motion of the lower bearings; and

e. retaining means closing up the upper portion of the central opening of said housing and being in contact with the upper terminating surfaces of said pair of outer plates, and having a central passage axially aligned with said central opening of said housing for retaining within a slideable stem having a lower tapered extension capable of sliding between said pair of outer plates and engaging and displacing said upper bearings and thereby pivoting said pair of toggle elements around said shaft means, said pivoting motion further causing said lower bearings to extend their co-sinusidal distance with respect to the supporting shaft means and thereby causing a downward motion of said displacement means.

4,549,720

DEVICE FOR RAISING AND LOWERING OBJECTS

Henning Bergenwall, Trollstigen 2, Sandviken, Sweden (811 36)

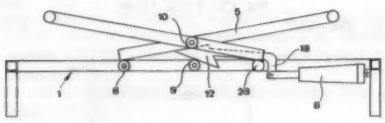
PCT No. PCT/SE83/00192, § 371 Date Jan. 19, 1984, § 102(e) Date Jan. 19, 1984, PCT Pub. No. WO83/04168, PCT Pub. Date Dec. 8, 1983

PCT Filed May 13, 1983, Ser. No. 579,906

Claims priority, application Sweden, May 21, 1982, 8203189

Int. Cl.⁴ B66F *3/00*

U.S. Cl. 254—124 **4 Claims**



1. A device for raising and lowering objects, such as bed frames and work tables, comprising:

a stand;

a first arm pivotable around a pivot axis carried by the stand and being adapted to support the object in question,

an extensible power mechanism fixed to said stand;

an element pivotally connected to the power mechanism by a hinge and being displaceable generally perpendicularly to the pivot axis of the first arm by extension of said power mechanism and having an end introducable between a portion of the first arm and a section of the stand located below said end of said element so as to move said arm and said stand away from each other by wedging contact therewith upon extension of said power mechanism, and thereby pivoting the first arm upwardly from the stand;

a second arm hingedly connected to the first arm and having an end portion facing away from said first arm for cooperation with a guide arranged in the stand, said guide extending perpendicularly to the pivot axis of the first arm, said second arm being displaceable and pivotable relative to said guide;

and a dog integrally connected to the element and, starting from a maximally downwardly pivoted position of the first arm, engaging the end portion of the second arm after an initial displacement of the element and after associated initial upward pivoting of the first arm,

said hinge between the element and the power mechanism being disposed below the end portion of the second arm such that the dog pivots about said end portion of said second arm to move the end of said element upwardly upon continued extension of the mechanism so as to further pivot said first arm upwardly after termination of said wedging contact.

4,549,721

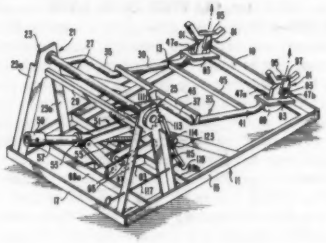
PORTABLE JACK FOR SMALL TRACTORS AND LIKE VEHICLES

Kenton A. Stone, 5034 N. 5th St., Arlington, Va. 22203

Filed Mar. 1, 1985, Ser. No. 707,035

Int. Cl.⁴ B66F *3/22*

U.S. Cl. 254—126 **18 Claims**



1. A portable jack for small tractors, riding lawn mowers, and the like vehicles having at least one chassis member, which jack comprises a base frome having a length generally greater than its width; an end stand mounted on said base frame adjacent one end thereof and including upstanding transversely spaced apart sides, each having two legs which are longitudinally spaced apart at the base frame, and means extending transversely between said sides to maintain said sides apart including a fulcrum bar adjacent the top of said sides; a pair of transversely spaced apart lifter arms connected to one end of said fulcrum bar for pivotal movement about the bar axis and extending longitudinally in generally parallel relation toward but stopping short of the opposite end of said base frame, with their free ends adapted to engage said chassis member, said lifter arms being braced apart by at least one transverse bracing bar located nearer their pivoted ends than their free ends; and means for applying lifting force via said bracing bar to said lifter arms including a screw actuat-d scissors jack having its base seated on said base frame generally between said end stand sides for limited rocking movement about a transverse axis and extending generally upwardly from said base frame, and a connecting link pivoted at one end to the upper end of said scissors jack and at the other to said bracing bar to form with said scissors jack an expandable toggle linkage between said bracing bar and said base frame which is operable to pivot said lifter arms about said fulcrum bar and elevate said vehicle chassis member engaged thereby.

4,549,722

JACK ADAPTER FOR CRADLE SUPPORTING OF VEHICLE DIFFERENTIALS AND TRANSMISSIONS

Victor Gagliano, 192 Howard Ct. #6, Fox Lake, Ill. 60020

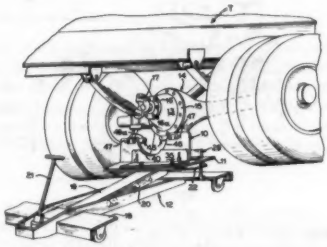
Filed Jun. 5, 1984, Ser. No. 617,512

Int. Cl.⁴ B66F *3/00*

U.S. Cl. 254—134 **11 Claims**

1. An adapter for use with a low level jack having a support pad with slots in the front and rear ends thereof to cradle and support vehicle transmissions and differentials during removal from the vehicle, repair away from the vehicle, and reinstalla-

tion on the vehicle which comprises a rear angle bracket having an upstanding leg with an open top recess for embracing the rear end of a transmission or differential housing and a horizontal leg for resting on the rear end of the pad, a front angle bracket having a vertically slotted upstanding leg and a horizontal leg for resting on the front end of the pad, fasteners extending through the slots of the pad and through the horizontal legs of the angle brackets to selectively position and secure the brackets on the pad, an upstanding plate slidable on the upstanding leg of the front bracket having an open top recess for receiving the front end of a transmission or differential housing, fasteners extending through the slots of the upstanding leg of the front bracket securing the plate to the bracket and accommodating raising and lowering of the plate, said plate having a horizontal slot on each side of the recess adjacent the top of the plate, a rigid horizontal strap overlying each horizontal slot of the plate on each side of the recess, each



strap having an apertured inner end for projecting into said recess adapted to receive bolts secured in the front end of the transmission or differential housing, a pair of fasteners extending through each horizontal slot of the plate and through the overlying strap locking said strap on said upstanding plate, said rear bracket being shiftable laterally of said pad, said front bracket being shiftable transversely and laterally of said pad whereby the jack pad can be lifted adjacent the differential or transmission and the brackets thereon shifted to receive the front and rear ends of the transmission or differential housing in the recesses thereof, the straps adjusted to receive bolts from the front end of the housing in the apertured ends thereof and then fixedly secured to the upstanding plate in horizontal position, the housing uncoupled from the vehicle, the jack lowered with the housing thereon to clear the vehicle for transport to a work station to present a transmission or differential to a worker for servicing and the jack replaced under the vehicle to present the housing in position for reinstallation.

4,549,723

CABLE BLOCK DEVICE

Charles R. Castilano, Dayton, Ohio, assignor to Jackson Enterprises, Clayton, Ohio

Filed Jul. 11, 1984, Ser. No. 629,887
Int. Cl.[4] B66D *3/04*
U.S. Cl. 254—405 **15 Claims**

1. A cable block device for attachment to a support strand and adapted to support a cable comprising:

a bracket provided with a support element for engagement with a support strand for support of the bracket upon the support strand,

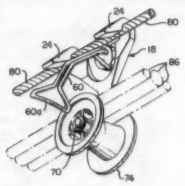
a rotary shaft supported by the bracket,

a lever attached to the shaft for rotation thereof,

a cam attached to the shaft for rotation therewith, the cam being provided with an engagement surface for engagement of the cam with a support strand with which the support element is in engagement, the cam forcing the strand against the support element for clamping the bracket to the strand,

a roller rotatively attached to the bracket,

an arm provided with a main portion which extends angularly from the cam and which moves angularly with rotative movement of the lever and the cam, the arm being provided with a retainer portion which extends laterally and substantially at right angles with respect to the main portion of the arm, the retainer portion of the arm being movable with angular movement of the arm to a position



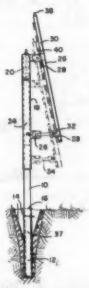
spaced from the roller for receipt of a cable upon the roller, the retainer portion of the arm being movable with angular movement of the arm to a position adjacent the roller to prevent escape of a cable from the roller, the retainer portion being closely adjacent the roller when the cam is in any rotative position in which the cam engages a support strand upon which the bracket is supported.

4,549,724

SELF-ORIENTABLE BARRIER FENCE

Joan-Michel Taillandier, La Cote, Herbeys, Eybens 38320, France

PCT No. PCT/FR81/00122, § 371 Date May 24, 1982, § 102(e) Date May 24, 1982, PCT Pub. No. WO82/01204, PCT Pub. Date Apr. 15, 1982
PCT Filed Sep. 24, 1981, Ser. No. 385,386
Claims priority, application France, Sep. 25, 1980, 80 20793
Int. Cl.[4] E01F *7/02*
U.S. Cl. 256—12.5 **12 Claims**



1. A barrier fence for use in controlling airborne particles, said barrier fence comprising a frame and a plurality of boards connected to said frame, said boards being spaced from one another, and means for automatically positioning said fence continuously in any position about 360° and which is perpendicular to the direction of a wind current, said means for automatically positioning said fence comprising a support adapted to be connected to a base structure, a rotation tube mounted on said support, said rotation tube having a top end and a bottom end, wherein said frame is connected to said rotation tube, said rotation tube further comprising tilting means for altering the angle of said frame in accordance with the slope of terrain on which said barrier fence is placed.

4,549,725

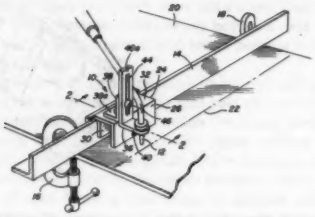
CUTTING TOOL GUIDE

Roger W. Carroll, 1029 E. Prarie St., Jerseyville, Ill. 62052

Filed Nov. 28, 1984, Ser. No. 676,412

Int. Cl.[4] B23K *7/10*

U.S. Cl. 266—58 **11 Claims**



1. A cutting guide for use in guiding a cutting tool such as a blowtorch along a guide rail for cutting metal plate and the like comprising a body member having means defining a slide member for receipt on the guide rail, a holder attachment on the exterior of the body member for receiving the cutting tool and holding same with an operating tip of the tool in position spaced forwardly of the slide member, and means forming a splatter shield between the operating tip of the cutting tool and the slide member for protecting the slide member against molten metal and the like produced by the cutting tool during cutting.

4,549,726

MOUNTING MEMBER FOR MOUNTING AN ENGINE OR TRANSMISSION OF A MOTOR VEHICLE

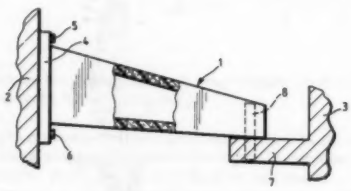
Ralf-Thilo Schulz, Putzbrunn, and Helmut Rapp, Brunnthal, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Oct. 11, 1983, Ser. No. 540,889

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1982, 3238587

Int. Cl.[4] B32B *17/04, 27/04*

U.S. Cl. 267—140.5 **13 Claims**



1. A mechanical mounting system for mounting a drive unit of a vehicle in a vehicle chassis, comprising a noise producing, mechanically vibrating drive unit, a support structure in said vehicle chassis for supporting said drive unit, a plurality of mounting members mounting said drive unit to said support structure, each of said mounting members comprising an elongated body portion having a longitudinal axis extending substantially horizontally in its use condition, a connection end rigidly connected to said vibrating drive unit, and a mounting end rigidly connected to said support structure, said body portion, said connection end, and said mounting end of each of said mounting members being made of fiber reinforced resin material as an integral, single piece spring having a predetermined orientation of fibers in said fiber reinforced resin material relative to said longitudinal axis extending substantially horizontally, said fiber reinforced resin material comprising several fiber layers, wherein the fiber orientations vary from fiber layer to fiber layer or groups of layers relative to said longitudinal axis extending substantially horizontally from said drive unit to said support structure for providing a sufficient spring stiffness causing simultaneously a mechanical vibration damping and an acoustical noise damping by said plurality of mounting members.

4,549,727

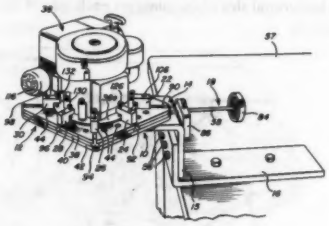
LAZY SUSAN VISE

John J. Kozar, 800 Carl Ave., New Kensington, Pa. 15068

Filed Sep. 26, 1983, Ser. No. 536,190

Int. Cl.[4] B23Q *1/04*

U.S. Cl. 269—70 **7 Claims**



1. A vise structure comprising a worktable, clamping means associated with the worktable for releasably retaining an article thereon, a plate-like base member, a bearing ring mounting the worktable in a circular opening in the base member for rotary movement of the worktable, and a latch device for releasably retaining the worktable in selected rotational positions relative to the base member wherein the latch device comprises an elongate rod disposed radially with respect to the bearing ring in a bore in the base member, circumferentially displaced radially extending holes in the bearing ring, an inner end of the rod being insertable into a selected hole to retain the worktable in a selected angular position, biasing means urging the rod inwardly toward said holes, the biasing means comprising a biasing coil spring around a portion of the rod extending through a cutout in the base member, the spring acting between an abutment member fixed on the rod and an end wall of the cutout, and retaining means for holding the rod in an outer unlatched position overcoming the force of said biasing means and allowing the worktable to be freely rotated, the retaining means comprising a collar on an actuating portion of the rod extending outwardly from the base member, and a screw for tightening the collar onto the rod with the collar engaging an outer edge surface of the base member and retaining the rod in the outer unlatched position.

4,549,728

SUCTION/AIR PRESSURE DEVICE FOR SLOWING DOWN SIGNATURE IN CHOPPER FOLDER OF FOLDING MACHINE

Michel Odeau, Creil, France, assignor to Harris-Marinoni S.A., Montataire, France

Filed Jun. 1, 1984, Ser. No. 616,393

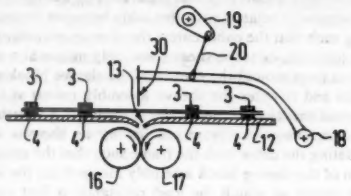
Claims priority, application France, Jun. 6, 1983, 83 09350

Int. Cl.[4] B42C *1/00*

U.S. Cl. 270—46 **8 Claims**

1. A device for slowing down signatures to be folded in a chopper folder of a known type comprising a table formed with a slot therein parallel to the direction of movement of the signatures, a headstop perpendicular to such direction, two fold rollers disposed below the slot, and a blade cooperating with said fold rollers for folding the signatures centered with respect to said slot, and further comprising means for applying vacuum or underpressure acting upon each signature to be folded to slow it down progressively as it approaches said

headstop, the slowing down force being applied to prevent bouncing of the signature off said headstop, on the one hand, and on the other hand, to produce tension in the signature until said vacuum applying means are suddenly brought to atmosphere, said vacuum applying means comprising at least one series of holes disposed in accordance with the direction of



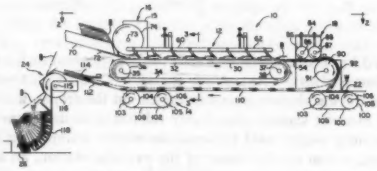
movement of the signature to be folded in order to be obturated thereby one after the other until obturation of all the holes in the series of holes, which corresponds to maximum vacuum and thus maximum slow down of the signature, said vacuum applying means comprising a box secured under said table and said series of holes being formed in said table.

4,549,729

OVERLAP CONVEYOR APPARATUS

Armand C. L. Hoffstetter, Town & Country, Mo., and Charles K. Cason, Caseyville, Ill., assignors to Ga-Vehren Engineering Company, St. Louis, Mo.

Filed Jan. 18, 1983, Ser. No. 458,882
Int. Cl.[4] B42B *1/02*
U.S. Cl. 270—53 **9 Claims**



1. A conveyor apparatus for use in a business form machine of the type used for processing an elongate web having transverse gum lines, the apparatus depositing blanks onto said web in overlapping relation to each other, the apparatus comprising:

(a) a first conveyor including at least one endless flexible element and having upper and lower spans, said element having a plurality of pins disposed at spaced intervals along the length thereof, said pins having an inclined flank receiving the leading end of the blank and another flank engageable with the trailing end of the blank in pushing relation, said flanks being generally fixed relative to the direction of travel of the flexible element of the upper conveyor,

(b) a second conveyor carrying the elongate web,

(c) blank feed means at the upstream end of the first conveyor for depositing blanks onto said upper span of said conveyor with the leading end of the blank extending beyond the leading flank of a pin and being disposed in overlapping relation above the trailing end of the preceding blank, and

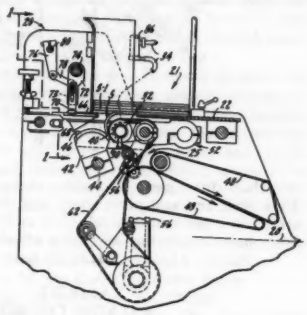
(d) blank take off means at the downstream end of the first conveyor for removing blanks from the upper span of said conveyor and depositing said blanks onto the web carried by the second conveyor with the leading end of the blank being disposed in underlapping relation below the trailing end of the preceding blank and in contact with a gum line of the web.

4,549,730

SIGNATURE MACHINES

Ronald W. Weller, Orland Park, and Terrence H. Drope, Downers Grove, both of Ill., assignors to McCain Manufacturing Corporation, Chicago, Ill.

Filed Oct. 26, 1983, Ser. No. 545,218
Int. Cl.[4] B65H *3/08*
U.S. Cl. 271—100 **2 Claims**



2. In a cyclically operable machine for feeding printed signatures one by one in successive cycles from a hopper where the signatures repose on one another in a horizontal attitude, in which feeding of the signatures is accomplished by a rotary suction gripper having a path of effective tangential contact with the signature to be fed, capturing and withdrawing that signature from the stack by suction and delivering it to a feeder synchronized to the suction gripper cycles: a rock shaft having a plurality of operating levers rigidly clamped thereto and means connecting a plurality of lift fingers to the respective levers, said lift fingers being positioned beneath the signature stack and so disposed that when the rock shaft is oscillated in one direction the fingers move in an ascending arc to lift the signature stack and displace it from the path of the suction gripper, a pair of solenoids having their armatures connected in a double-acting relation to a center pivoted lever clamped to said rock shaft, one solenoid being in an energized state and the other solenoid being in a deenergized state normally to hold the rock shaft stationary and dispose the fingers free of the signature stack so long as signatures are to be fed cyclically one by one by the action of the suction gripper, whereby upon reversing the states of the solenoids the rock shaft is oscillated in said one direction along with said operating levers to cause the fingers to lift the signature stack away from said path of tangential contact when a signature is not to be fed.

4,549,731

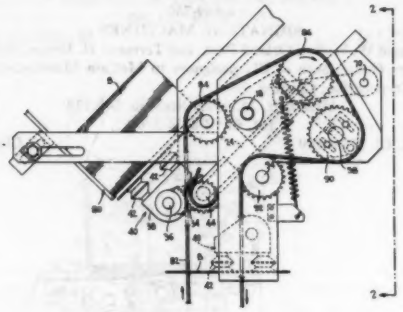
CARTON BLANK TRANSFER MECHANISM

Robert H. Ganz, 8 Ridgecrest Rd., Saddle River, N.J. 07458

Filed Sep. 30, 1982, Ser. No. 428,901
Int. Cl.[4] B65H *3/08*
U.S. Cl. 271—107 **4 Claims**

1. A carton blank transfer mechanism for transferring a carton blank from a hopper to a carton forming and applying apparatus, said transfer mechanism comprising a pivotally mounted arm, a suction head, means pivotally mounting said suction head on said arm for pivotal movement relative to said arm, said arm being mounted on a rotatable shaft, first drive means for oscillating said arm about said rotatable shaft, second drive means for separately oscillating said rotatable shaft in timed relation to oscillation of said arm, and third drive means between said arm and said suction head for oscillating said suction head relative to said arm, said means mounting

said suction head on said arm including a pivot shaft secured to said suction head and being rotatable relative to said arm, a drive shaft carried by said arm adjacent said pivot shaft, and



said third drive means including cooperating gears on said drive shaft and said pivot shaft, said drive shaft carrying a drive wheel and said rotatable shaft carries a drive wheel, and drive means connecting said drive wheels.

4,549,732

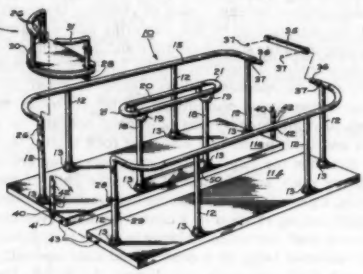
WALKING COURSE

Michael A. Hoffman, R.D. #1, Clifton Springs, N.Y. 14432

Filed Jun. 1, 1983, Ser. No. 500,095

Int. Cl.[4] A63B *23/04*

U.S. Cl. 272—70 **13 Claims**



1. A walking course for physically disabled people, said walking course comprising:

a. a generally oblong base;

b. a perimeter handrail mounted on said base and extending at handrail height around the outside of a generally oval walking path on said base;

c. a central handrail mounted on said base and extending at said handrail height along the inside of said walking path;

d. an openable and closable gate in said perimeter handrail for entering said path from outside said base; and

e. said base, said handrails, and said gate being dimensioned so that a person can enter said path on said base and walk around said path for exercise while gripping and guiding on both of said handrails.

4,549,733

WEIGHT TYPE EXERCISING DEVICE

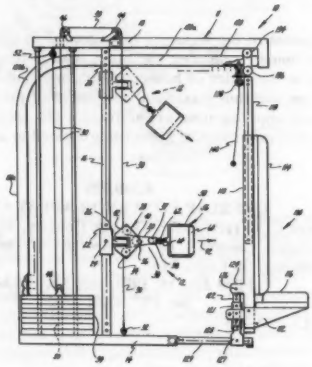
Alan Salyer, 1092 Louise, Ypsilanti, Mich. 48197

Filed Feb. 4, 1983, Ser. No. 464,092

Int. Cl.[4] A63B *21/06*

U.S. Cl. 272—118 **16 Claims**

1. In a cable exercise machine in which a user exercises against a load resistance through a cable and a system of sheaves on the machine frame, the improvement which comprises the cable being tethered on the frame of the machine at spaced apart points on the cable, a sheave assembly means adjustably positionable on the frame and comprising sheaves, a sheave block assembly means via which the user exerts force against the load resistance and comprising a sheave, said sheave assembly means and said sheave block assembly means being operatively related with the cable between its points of tethering such that the cable enters the sheave assembly means at a first location, exits the sheave assembly means at a second location to loop around the sheave of the sheave block assembly means and re-enter the sheave assembly means at a third location and exit the sheave assembly means at a fourth location, said sheave assembly means having its sheaves operatively relating the cable with the frame such that the amount of extension of the sheave block assembly means from the sheave assembly means at which the load resistance is first encoun-



tered by a user exerting a pull on the sheave block assembly means is always substantially the same for all adjustment positions of the sheave assembly means on the frame, including a leg exercise station operatively related with the sheave block assembly means, said leg exercise station comprising its own frame, a seat on the frame of the exercise station, an actuator beam pivotally mounted on the frame of the exercise station, a footplate assembly means on the frame of the exercise station operatively related with said actuator beam and poised for engagement by the feet of a user seated on said seat, means operatively relating said actuator beam, said sheave block assembly means, and said footplate assembly means such that the footplate assembly means is displaceable by the feet of a seated user along a line of action to impart pivotal motion to said actuator beam and said actuator beam is in turn effective to operate the load resistance via the sheave block assembly means.

4,549,734

RATCHET LOCK MECHANISM FOR EXERCISE HIP, LEG AND SQUAT SLED

Donald R. Hibler, Jr., Rte. 1, Box 36-H, Bates City, Mo. 64011, and Ernest D. Mask, 311 Marion La., Lee's Summit, Mo. 64063

Filed Jul. 19, 1983, Ser. No. 515,303

Int. Cl.[4] A63B *21/00*

U.S. Cl. 272—134 **5 Claims**

1. An exercise device, comprising:

a base;

an elongated, upright support operatively coupled to said base;

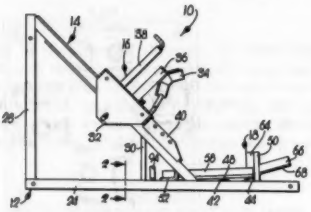
weight means shiftably mounted on said support for reciprocal movement therealong;

pad means located beneath said weight means for supporting a person lying in a supine position;

means for selective shifting of said pad means along a path of travel between a use position wherein the pad means is beneath said weight means and a person lying on said pad can elevate his legs and engage said weight means with his feet, and a stowed position wherein the person can locate himself beneath the weight means for engaging the latter with the upper part of his body, free of interference from the pad means; and

means for selectively locking said pad means in said use and stowed positions respectively, said locking means including

an elongated locking member having structure defining an aligned series of dog-receiving openings along the



length thereof and oriented along the length of said path of travel;

an elongated locking dog; and

means pivotally coupling said dog to said pad means, said dog being located generally above said openings and oriented for receipt therein in respective positions of the pad means along the length of said elongated locking member, said dog having surfaces thereon for engaging said member for permitting passage of the pad means along the length of said locking member without locking receipt thereof in said openings when said pad means is being shifted, said dog also being pivotal to a locking position wherein the dog is lockingly received in a respective opening, when said pad means is locked in a selected position.

4,549,735

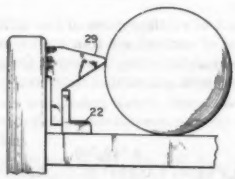
SIDE RAIL FOR OUTDOOR BUMPER POOL TABLE

Edward G. Dunn, Jr., 136 E. 50th St., Indianapolis, Ind. 46205, and Edward G. Dunn, Sr., 7701 Spring Mill Rd., Indianapolis, Ind. 46260

Filed May 17, 1984, Ser. No. 611,337

Int. Cl.[4] A63D *15/06*

U.S. Cl. 273—9 **7 Claims**



1. A multi-component pool table side rail suitably styled for prolonged use outdoors as part of a pool table, said side rail comprising:

a cushion member having a substantially flat outer surface, an inwardly directed wedge-shaped portion and a substantially flat attachment portion, said wedge-shaped portion and said attachment portion defining three inner edges, a first edge being the innermost edge and apex of said wedge-shaped portion, said second edge being the lower and inner corner of said attachment portion and the third edge being the inner corner intersection of said two portions, wherein the peripheral dimension of said cushion member along its surface from the first edge to the second edge via the third edge is larger than the dimension through space from the first edge to the second edge;

a fabric sleeve closed at one end and initially open at the opposite end and suitably sized for receiving said cushion member, and wherein the lateral inner peripheral dimension of said fabric sleeve is substantially equal to the peripheral dimension of said cushion member as measured along the cushion member's outer surface from the first edge to the second edge plus the dimension through space from the second edge to the first edge; and

a support strip attachable to the pool table and designed and arranged to clamp said fabric cover cushion member to said pool table by being applied to said cushion member against the surface extending between the second and third edges, said application to said surface and attachment to said pool table causing said fabric sleeve to be drawn taut around said closure member.

4,549,736

RACQUET FOR PLAYING A BALL GAME

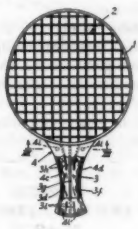
Mohammed H. Lotfy, 28, rue Cherif, Le Caire, Egypt

Filed Mar. 26, 1984, Ser. No. 593,533

Claims priority, application European Pat. Off., Sep. 7, 1983, 83401760.0

Int. Cl.[4] A63B *49/08, 59/04*

U.S. Cl. 273—67 R **20 Claims**



1. Racquet for playing a ball game, constituted by one piece moulded in rigid plastics material, comprising a frame across which extends a grid formed by rigid bars intersecting one another in two directions, and a handle of constant thickness, wherein the width of the handle decreases progressively from the frame to an intermediate zone of smallest width, then increases to the end of the handle, so as to define two opposite side walls in arcuate form, of outwardly facing concavity, and a sleeve made of rubber having the same shape as the handle is fitted and held firmly on said handle, said rubber sleeve being maintained in place on the plastics handle, without adhesion, by means of hollow parts provided on either the handle or on the sleeve and engage parts in relief provided on the sleeve and/or on the handle.

4,549,737

POOL-TYPE MARBLE GAME

Jerome J. Seyer, and Brenda J. Seyer, both of 419 Broadway, Cape Girardeau, Mo. 63701

Filed Jan. 25, 1984, Ser. No. 573,665

Int. Cl.[4] A63D *3/00*

U.S. Cl. 273—118 R **14 Claims**

1. A game device comprising:

a round game board;

means for supporting said round game board for rotation by a player during a game;

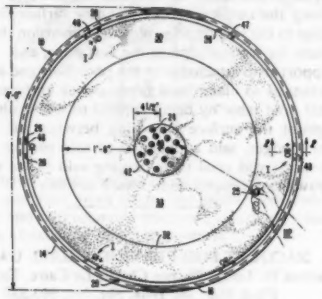
means for indicating shooting boundaries on a top surface of said game board;

a plurality of marbles having scoring numbers thereon;

at least one shooting marble for use by a game player;

scoring indicia means around the periphery of said round game board;

said means for supporting said round game board for rotation by a player during a game comprising a rotatable bearing mount, said rotatable bearing mount provided with a hub having a plurality of legs extending radially and horizontally therefrom;



said means for indicating shooting boundaries on a top surface of said game board including at least two concentric circles inscribed on said top surface, one circle being of relatively small inner diameter, and the other circle of a fairly large outer diameter;

said scoring indicia means on the periphery of the game board including a recess extending completely around the perimeter of the game board, said recess having scoring means associated closely adjacent thereto for indicating what score a player achieves during playing the game; and

said scoring indicia means including a vertical outer flange rim with an overhang surrounding said game board.

4,549,738

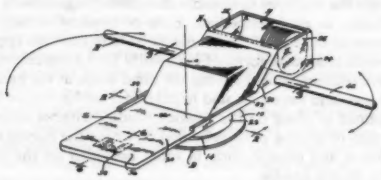
SWIVEL CHIP AND CARD DISPENSER FOR GAME BOARDS

Morris Greitzer, 3057 Earlmar Dr., Los Angeles, Calif. 90064

Filed Apr. 30, 1984, Ser. No. 605,169

Int. Cl.[4] A63F *1/10*

U.S. Cl. 273—148 A **17 Claims**



14. A swivel dispenser for game boards, wherein a platform in the form of a swivel arm extending diametrically of a turning axis has a card holder at one end and with a removable extension member for player access, and is rotatable upon a supporting base assembled therewith, and including;

a supporting hub centered on the base, and all of which is carried by a supporting flange having interface engagement with a supporting surface,

A supported hub centered on the swivel arm and engaged to rotate upon the supporting hub of the base,

and a pair of side openings in the card holder for slideable entry and transverse passage therethrough of the removable extension member, the extension member being of uniform cross section and adjustably extensible laterally from opposite sides of the card holder for manual engagement.

4,549,739

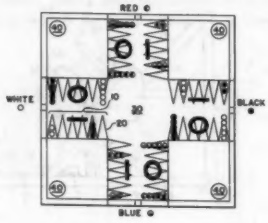
GAME APPARATUS FOR USE IN BACKGAMMON-LIKE GAMES

Patrick L. Tobin, 654 Malarin Ave., Santa Clara, Calif. 95050; Joseph W. Green, #1, 5570 Clover Crest Dr., San Jose, Calif. 95118, and John A. Lerohl, 6740 Altiplano Way, San Jose, Calif. 95119

Filed Feb. 15, 1983, Ser. No. 466,502

Int. Cl.[4] A63F *3/00*

U.S. Cl. 273—248 **2 Claims**



1. A game apparatus for playing backgammon like games comprising:

a game board having:

four rectangular corner areas of the same size and shape each having two of its sides forming a portion of an edge of the game board, the length of the sides of each corner area being approximately one-third the total length of the corresponding edge of the game board with each corner area being devoid of any indicia which is essential to the playing of the game;

a first rectangular playing surface disposed between one and an opposite edge of the game board intermediate the corner areas on those edges;

a second rectangular playing surface disposed between the other two edges of the game board intermediate the corner areas on those edges; and

a plurality of triangularly shaped game points extending into each rectangular playing surface from each juncture of the corner areas and the rectangular playing surfaces with the game points on the adjacent sides of the playing surface being aligned with each other;

said first and second rectangular playing surfaces crossing in the center of the game board, that central area being devoid of any indicia which is essential to the playing of the game;

sixty stones each of a different one of four different colors with fifteen stones of each of said four colors; and

means for randomly selecting a number from a limited set of numbers, said selected number determining the play of one of said stones.

4,549,740

COUPLING GUARD SEAL ASSEMBLY

Norman E. Nutter, Lunenburg, Mass., assignor to General Elecrtric Company, Lynn, Mass.

Filed Dec. 24, 1984, Ser. No. 685,641

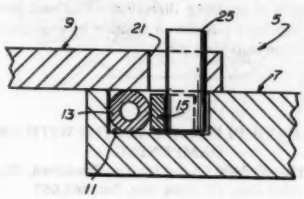
Int. Cl.[4] F16J *15/16*

U.S. Cl. 277—189 **3 Claims**

1. A seal assembly comprising:

an inner surface and an outer surface in part concentrically positioned with respect to one another, the outer surface partially overlapping the inner surface to form an overlapping joint;

a groove formed on the exterior of the inner surface;
a gasket positioned in the groove;
a notched ring positioned in the groove adjacent the gasket including a plurality of notches formed on the ring side further away from the gasket;



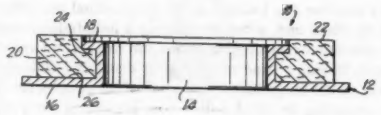
a plurality of slots formed through the outer surface and aligned with the notches formed in the ring; and,
a plurality of cam pins each inserted through a slot and into a notch whereby in a locked position the cam pin forces the notched ring against the gasket causing the gasket to elongate in the radial direction against the two surfaces.

4,549,741

COMBINATION METAL AND KNITTED WIRE MESH GASKET

Peter P. Usher, Union, and Eugene J. Gavaletz, Toms River, both of N.J., assignors to Metex Corporation, Edison, N.J.

Filed Jun. 4, 1984, Ser. No. 616,972
Int. Cl.[4] F16J *15/02*
U.S. Cl. 277—236 **6 Claims**



1. A gasket comprising a gasket body formed of metal and having interconnected first and second portions and a layer of knitted wire mesh having a recess extending along the internal circumference of a first surface thereof and receiving the first portion of said metal gasket body and the second surface of said knitted wire mesh engaged with the second portion of said metal gasket body such that the first portion of said metal gasket body and knitted wire mesh form a first surface of said gasket and the second portion of the metal gasket body forms the second surface of said gasket.

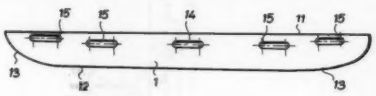
4,549,742

ICE SKATE

Zdenek Husak; Zdenek Svozil; Ivan Mazak, all of Olomouc; Josef Lehky, Vrbatky; Josef Hora, Police n/Met; Zdenek Smid, Uhonice, and Ondrej Kebrle, Brno, all of Czechoslovakia, assignors to Koh-i-noor Bilovec, norodni podnik, Bilovec, Czechoslovakia

Continuation-in-part of Ser. No. 260,762, May 5, 1981, abandoned. This application Aug. 31, 1983, Ser. No. 528,233
Claims priority, application Czechoslovakia, May 5, 1980, 3265-80
Int. Cl.[4] A63C *1/32*
U.S. Cl. 280—11.18 **2 Claims**

1. In an ice skate comprising a molded integral support body made of plastic material and a metal skate blade having a body with a forward end, a rear end, and a substantially straight, unbroken upper edge, the upper portion of the blade having been embedded in the lower portion of the support body during the molding of the support body, the improvement wherein the skate blade has in the longitudinal direction thereof a central through-hole which is entirely filled by a portion of the molded plastic material of the support body which was introduced thereinto during the molding of the support body, the skate blade body having at least two further through-holes therein located below the upper edge thereof, one of which is disposed a distance forwardly of the central through-hole which is a large fraction of the length of the blade and the other of said further through-holes in the blade being disposed a distance rearwardly of the central through-hole which is a large fraction of the length of the blade, the two further through-holes in the skate blade being elongated in the longitudinal direction of the blade, further portions of the plastic material of the support body extending through said at least



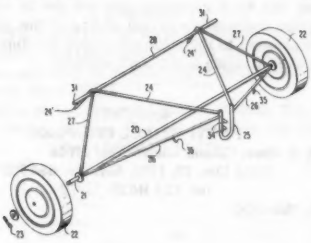
two further through-holes in the blade, said further portions of the plastic material having been introduced into said at least two further through-holes in the blade during the molding of the support body, said further portions of the plastic material completely filling a longitudinal part of substantial length of said at least two further through-holes in the blade, said two further portions of the plastic support body being shorter in the longitudinal direction of the skate blade than the at least two further through-holes in the skate blade, whereby voids of appreciable longitudinal dimensions are present between the ends of the respective further through-holes which lie adjacent the central through-hole in the blade and the confronting ends of the further portions of the plastic support body disposed in the respective further through-holes in the blade.

4,549,743

HAY BALE CARRIER

Dale H. Shimon, P.O. Box 100, Esparto, Calif. 95627

Filed Dec. 14, 1983, Ser. No. 561,235
Int. Cl.[4] B62B *1/14*
U.S. Cl. 280—47.13 R **13 Claims**



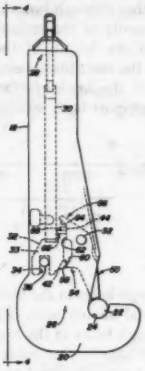
1. A carrier for a hay bale or the like comprising a wheeled axle member, a framework secured to the axle member and including at least a pair of frame members spaced above the axle member and defining an abutment plane for the carrier with a surface of a bale and a transverse attaching member spaced above and rearwardly of the axle member and substantially parallel therewith and near said abutment plane, bale wire retainer means on the carrier near the forward end thereof and away from the attaching member and somewhat below said plane and above said axle member, and said attaching member including two bale wire engaging end portions projecting laterally outwardly of said pair of frame members.

4,549,744

QUICK COUPLER LATCH

Herbert W. Herr, Waterloo; Seaton Moon, Cedar Falls, and James E. Hopper, Waterloo, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Aug. 20, 1984, Ser. No. 642,476
Int. Cl.[4] B60D *1/04*
U.S. Cl. 280—415 A **10 Claims**



1. In a quick coupler having a frame with a hook having a hitch pin receiving recess therein, and a latch pivotally supported by the frame and movable to open and closed positions in response to movement of an operator-movable control bar, the improvement wherein:

a guide member resistant to bending deformation is rigidly fixed to and movable with a lower end of the control bar, the guide member having a guide slot therein, and having at least one latch engaging part;

a guide pin extending horizontally through the frame and slidably received by the guide slot, the frame including support means for supporting the guide pin and for substantially preventing bending deformation of the guide pin; and

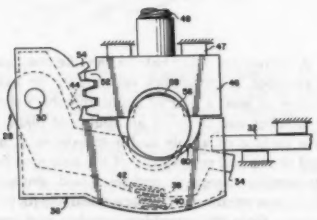
the latch having at least one guide member engaging surface engageable with the at least one latch engaging part, the at least one latch engaging part and the at least one cam surface cooperating so that sliding of the guide member with respect to the guide pin causes pivoting of the latch between its open and closed positions.

4,549,745

FIFTH WHEEL COUPLER

William A. Barr, Gibson Island, Md. 21056

Filed Oct. 25, 1984, Ser. No. 664,703
Int. Cl.[4] B62D *53/12*
U.S. Cl. 280—434 **7 Claims**



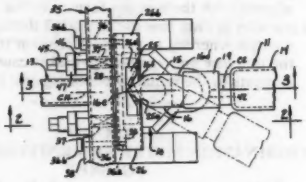
7. A fifth wheel coupler comprising a jaw member mounted for movement between an open position to one side of the path of movement of a king pin movable in a coupling direction to a closed position across said path, a mechanism operable by a king pin during its movement in a coupling direction for driving said jaw to its closed position, and yielding means biased between said mechanism and said jaw enabling said mechanism to continue to be operated by said king pin to the full extent of its movement in a coupling direction when said jaw is prevented from moving to its closed position by engagement with an obstruction on said king pin.

4,549,746

VEHICLE COUPLING APPARATUS WITH SWAY DAMPENING

Clarence H. Hager, 3408 Corbridge La., Rockford, Ill. 61107

Filed Oct. 17, 1984, Ser. No. 661,657
Int. Cl.[4] B60D *1/00*
U.S. Cl. 280—446 B **13 Claims**



1. A coupling apparatus for interconnecting two vehicles for relative pivotal movement comprising, a hitch member having a longitudinal centerline and adapted for attachment at one end to a first vehicle, a hitch ball extending upwardly from the hitch member at a location on its longitudinal centerline adjacent its distal end, a coupler having a longitudinal centerline and adapted for attachment at one end to a second vehicle, the coupler having a head portion at its distal end defining a ball socket on the longitudinal centerline of the coupler for detachably receiving the hitch ball, a nose projecting from the head portion of the coupler at the longitudinal centerline of the coupler, guide means defining a guideway, a slide block mounted on the guide means for movement along the guideway, friction brake means for frictionally retarding movement of the slide block along the guideway, means mounting the guide means to extend horizontally and crosswise of the longitudinal centerline of the hitch member at a location spaced from the hitch ball, the slide block having a notch in the side adjacent the hitch ball for receiving the nose on the coupler and such that horizontal swinging movement of the coupler about the hitch ball causes sliding movement of the slide block along the guideway when the coupler swings horizontally in either direction from a position in which the longitudinal centerline of the coupler is aligned with the longitudinal centerline of the hitch member.

4,549,747

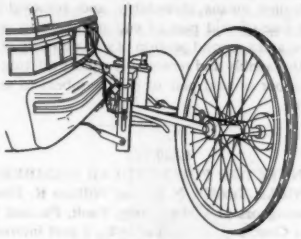
FIFTH WHEEL LIFTER/PROTECTOR

Reeves E. Testerman, Bellefontaine, Ohio, assignor to The United States of America as represented by the Secretary of the Department of Transportation, Washington, D.C.

Filed Jun. 1, 1983, Ser. No. 500,057
Int. Cl.[4] B60D *7/02*
U.S. Cl. 280—446 R **6 Claims**

1. In a trailer hitch for attaching a ground-supported device to a vehicle, said device being supported by wheel means engaging the ground during forward travel of said vehicle and having a longitudinally extending tongue which is attached to said hitch, said hitch having provisions for allowing said tongue to pivot in the horizontal and vertical directions, the

improvement which comprises: means for raising said device including said wheel means entirely off the ground when said



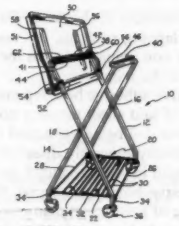
tongue has pivoted beyond a certain point in the horizontal direction.

4,549,748

TRANSPORTABLE AND COLLAPSABLE BAG CARRYING CART

Thomas S. Haley, Sr., 14 Hemlock Ct., Cromwell, Conn. 06416

Filed Apr. 6, 1984, Ser. No. 597,700
Int. Cl.⁴ B62B *3/02*
U.S. Cl. 280—641 **46 Claims**



1. A foldable bag holding cart comprising:

first and second frame means, said first frame means pivotally connected to said second frame means, each of said first and second frame means having an inverted U-shape, said U-shape including two substantially vertical legs having a cross-piece member therebetween;

collapsable base means pivotally attached to said first and second frame means;

roller means connected to said first and second frame means whereby said cart is transportable;

locking means whereby said cart is capable of being retained in a folded position;

first and second bag retension bar means, said bar means being attached to said cross-piece members, each of said has retension bar means including two parallel straight portions interconnected at each end by a U-shape retaining member;

slidable cover means, said cover means capable of being retained in at least an open position and a closed position.

4,549,749

PILLAR INTEGRATED WEB GUIDE

Rudy V. Thomas, Sterling Heights, Mich., assignor to Allied Corporation

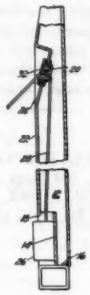
Filed Sep. 28, 1983, Ser. No. 536,930
Int. Cl.⁴ B60R *21/10*
U.S. Cl. 280—808 **24 Claims**

1. An integrated web guide for a three point seat belt system of an automotive vehicle having a buckle mounted to a structural member of the vehicle, an adjustable tongue attached to a continuous seat belt webbing, one end of the webbing attached to another structural member of the vehicle and the other end connected to a retractor, characterized by:

a hollow vehicle pillar having a circular aperture through its inboard surface proximate the shoulder height of a seated occupant and a retractor well at its base;

an annular race disposed in said circular aperture, said race having a first portion of a retaining means, a radical slot, and a pair of peripheral flanges circumscribing said circular aperture on opposite sides of said inboard surface:

a circular web guide rotatably disposed in said annular race, said web guide having a web slot passing therethrough and a second portion of said retaining means cooperating with said first portion to rotatably retain said web guide in



said race, said web slot having a contoured lower bearing surface;

a webbing retractor attached to said pillar in said retractor well, said webbing retractor including a continuous webbing passing through said web slot, said webbing having a first portion external to said pillar, the end of said first portion anchored to a structural member of the vehicle and a second portion internal to said pillar, the end of said second portion attached to said webbing retractor; and

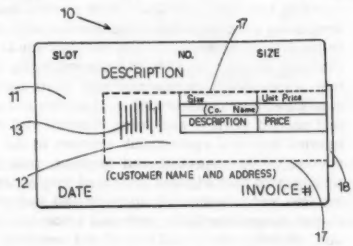
an adjustable tongue connected to said first portion of said webbing between said web guide and said end anchored to a structural member of the vehicle, said adjustable tongue adapted to be connected to the buckle.

4,549,750

SYSTEM FOR PROVIDING UPDATED PRODUCT AND PRICING INFORMATION FOR RETAILER

Joel R. Stone, and Gary H. Stone, both of 2141 Upper St. Dennis, St. Paul, Minn. 55116

Continuation of Ser. No. 455,918, Jan. 6, 1983, Pat. No. 4,519,631. This application Mar. 11, 1985, Ser. No. 710,326
Int. Cl.⁴ B42D *15/00*
U.S. Cl. 283—79 **2 Claims**



1. A shipping and price information label for use in identifying products in a shipping container and for providing consumer intelligible pricing information when the products are

removed from the shipping container and placed on a store shelf for retail sale, comprising:

a rectangular label blank;

a first section of said blank being defined by one outer edge of the blank and by connected scored tear-lines in the blank paralleling the other outer edges of the blank;

said first section containing consumer intelligible product pricing indicia on its face;

the remaining section of the label blank containing computer generated product pricing information and product shipping information on its face;

a layer of adhesive on the back of said remaining section for adhesively attaching the label blank to a shipping container; and

means for preventing the first section from adhering to a shipping container whereby said first section can be separated from said label blank and from a shipping container and placed on a store display shelf after the label blank has been adhesively attached to a shipping container.

4,549,751

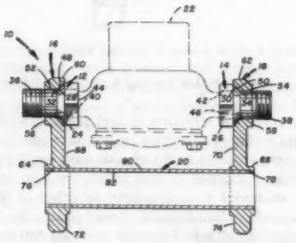
UNIVERSAL SUPPORT FOR METERS

Leslie W. Grove, Jr., 409 Biggs Ave., Frederick, Md. 21701

Filed Feb. 3, 1984, Ser. No. 576,880

Int. Cl.[4] F16L *35/00*

U.S. Cl. 285—30 **9 Claims**



1. A support system for an object, comprising:

a pair of adapter means, geometrical shaped means on the inner sides of each of said adapter means for being removably affixed to an object to be supported;

a pair of end members, each said end member consists of a first body portion, a second body portion, and a third body portion, said second body portion affixing said first body portion to said third body portion, said first and third body portions each having an aperture therethrough, said aperture through said first body portion having a countersunk portion on one side thereof, each said adapter means having a first portion, a second portion, and a third portion, said second portion being between said first and third portions, said first, second and third portions being configured along a common centerline therethrough and passing through the aperture in the first body portion in its respective end member, said second portion being configured into a cylindrical section and said third portion being configured into a truncated shaped section and adjacent to said second portion and being slidably and removably inserted into said countersunk aperture in the first body portion of its respective end member, said cylindrical section with said adjacent truncated shaped section nesting into said countersunk aperture and said geometrical shaped means interfacing with said truncated shaped section, whereby one of said pair of end members is slidably and removably affixed to one of said pair of adapter means, and the other end member of said pair of end members is slidably and removably affixed to the other adapter means of said pair of adapter means;

a spacer member, said spacer member being slidably and removably affixed to each of the third body portions of said pair of end members; and

a plurality of fastening means, a first portion of said plurality of fastening means threadably and removably rigidly affixing one of said pair of end members to said spacer member, and a second portion of said plurality of fastening means threadably and removably rigidly affixing the other end member of said pair of end members to said spacer member.

4,549,752

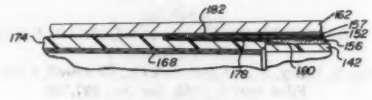
CONNECTOR FOR TUBULAR MEMBERS

Helmut E. Nimke, Tuxedo, N.Y., and William R. Thomas, Exton, Pa., assignors to UMAC, Inc., Paoli, Pa. and Brooklyn Union Gas Company, Brooklyn, N.Y., a part interest

Continuation-in-part of Ser. No. 292,455, Aug. 13, 1981, Pat. No. 4,465,309. This application May 25, 1984, Ser. No. 613,380

Int. Cl.[4] F16L *21/06*

U.S. Cl. 285—55 **16 Claims**



1. A device for connecting together tubular members, comprising:

a resilient sheet member in the form of a coil having at least partially overlapping surfaces, the inner diameter of said sheet member coil being less than the outer diameters of the members to be joined;

a first heat sensitive adhesive bonding material applied to the inner surface of said sheet member coil;

said sheet member coil being expanded to a larger diameter against a resiliently inwardly directed force of said sheet member and held in said expanded condition by said heat sensitive adhesive bonding material, the expanded larger diameter being of a sufficient diameter to receive the ends of said members to be joined, whereby said ends may be easily inserted into said coiled sheet member, said coiled sheet member being heatable whereby said heat sensitive adhesive bonding material holding said coil expanded melts allowing said sheet member to contract inwardly forming a tight bond between the inner surface of said sheet member and said members to be joined to form a strong bond upon cooling of said first heat sensitive bonding material between said inner surface of said coil and said tubular member being joined with said resilient sheet member coil providing support; and

a second heat sensitive adhesive bonding material applied to the outer surface of said sheet member coil after cooling of said first heat sensitive adhesive bonding material.

4,549,753

ROTARY JOINT

Rene T. Nuytten, North Vancouver, Canada, assignor to Can-Dive Services Ltd., North Vancouver, Canada

Filed Sep. 27, 1982, Ser. No. 424,339

Int. Cl.[4] F16L *27/00*

U.S. Cl. 285—95 **11 Claims**

1. A rotary joint comprising:

(a) a sealing member having a sealing end with an annular axially facing, sealing surface portion;

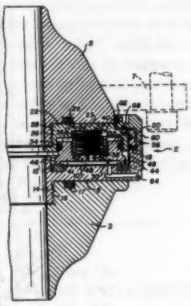
(b) a retaining member having a circular retaining end concentric with the sealing surface portion of said sealing member;

(c) a central member disposed axially between said sealing and retaining members, and having:

(i) a circular first end dimensioned and axially slidably mounted on the retaining end of said retaining member

so as to define a first variable volume chamber therebetween;

(ii) a second end with an annular bearing member concentric with, and normally rotatably abutting the sealing surface portion, so as to define an annular side wall of a second chamber between the first end and the sealing



end of said sealing member, which second chamber is interconnected with the first chamber;

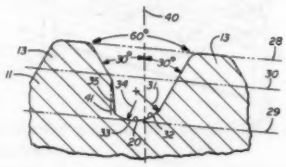
such that fluid pressure produced in the first chamber as a result of axial pressure pushing said retaining member toward said sealing member, is transmitted to said second chamber.

4,549,754

TOOL JOINT

Donna D. Saunders; Manmohan S. Kalsi, and Gun-Shing Chen, all of Houston, Tex., assignors to Reed Tubular Products Company, Sugar Land, Tex.

Filed Jun. 20, 1983, Ser. No. 505,948
Int. Cl.[4] F16L *25/00*
U.S. Cl. 285—334 **7 Claims**



1. A tool joint pin comprising:

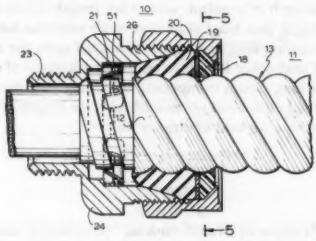
a tapered pin member having an external V-configuration truncated standard thread, said standard thread having at least its last thread away from the end of the pin provided with a root cut on a radius which is greater than the truncation of the standard thread root and less than one-half the distance along a line extending perpendicular from the load flank to the pitch diameter of the opposed unloaded flank, and said loaded flank being tangent to said root at their point of juncture, said root radius terminating on the unloaded flank side of the thread centerline and short of a plane parallel to the thread centerline and passing through the unloaded flank pitch diameter, and said termination of said root radius being connected to the unloaded flank by a surface diverging outwardly from a plane through said termination of said root radius and parallel to said thread centerline.

4,549,755

ARMORED CABLE CONNECTOR

Vincent Kot, Wantagh; Bruce Wallis, Northport, and Alfred Robinson, Brooklyn, all of N.Y., assignors to Efcor, Inc., East Farmingdale, N.Y.

Filed Jun. 16, 1983, Ser. No. 505,053
Int. Cl.[4] F16L *19/06*
U.S. Cl. 285—341 **9 Claims**



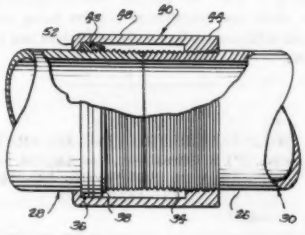
1. A connector for coupling an armored cable comprising a body member with a peripheral screw thread and an axial bore with an inner radial constriction, a gland nut engaging said screw thread and having a peripheral shoulder confronting said constriction, and a sealing and anchoring assembly entrapped and axially compressible between said constriction and shoulder and characterized in that said assembly includes a relatively soft deformable sealing bushing, a relatively hard, flexible split anchoring ring coaxial with said bushing, said ring and bushing having axially spaced circumferentially parallel, confonting faces, and a relatively stiff annulus sandwiched between said confronting faces of said bushing and ring whereby tightening of said nut on said body member axially compresses and radially contracts said bushing and radially contracts said ring and said annulus minimizes the transmission of torque between said ring and bushing.

4,549,756

CONDUIT COUPLING ASSEMBLY

Raffaele Basile, Chicago Heights, Ill., assignor to Allied Tube & Conduit Corporation, Harvey, Ill.

Filed May 31, 1983, Ser. No. 499,192
Int. Cl.[4] F16L *25/00*
U.S. Cl. 285—388 **8 Claims**



1. A conduit coupling assembly for connecting the end portions of a pair of lengths of tubular conduit or the like in coaxial, abutting relationship, said end portions each having external threads of the same size, said coupling assembly comprising:

an abutment ring having an internal thread sized for threading onto the end portion of one of said lengths of conduit;

locking means preventing unthreading of said abutment ring once it is threaded; and

an outer coupling having a first end and a second end and a

bore extending therebetween sized to slidably, rotatably receive said abutment ring, said coupling ends having inside dimensions smaller than an outside dimension of said ring so that said ring is unable to move past said coupling ends, said coupling first end having an internal thread sized for threading onto said conduit end portions whereby, with said coupling first end threaded onto the end portion of said one length of conduit and facing the other length of conduit, said other length of conduit can be brought into axial alignment with said one length and said coupling first end can be threaded onto the end portion of said other length to couple the lengths of conduit, said locking means comprising a locking ring disposed in the thread of the end portion of said one length of conduit and backing up said abutment ring.

4,549,757

BUMPER

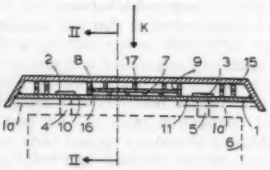
Jan H. K. Minkhorst, Munstergeleen, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed Jan. 4, 1984, Ser. No. 568,260

Claims priority, application Netherlands, Jan. 14, 1983, 8300134

Int. Cl.⁴ B60R *19/08*

U.S. Cl. 293—120 **9 Claims**



1. Bumper to protect an object, for example a vehicle, against impact, said bumper comprising a plate-like element consisting essentially of a resilient plastic, said element including at least two lengthwise-arranged fastening points, means for fastening the element, at said fastening points, in spaced relationn to an object that is to be protected against impact, and stiffening means positioned between said two fastening points for providing a stiffened portion of said element along a predetermined lengthwise distance, said stiffened portion also establishing at least one pair of unstiffened portions of said element, each said unstiffened portion being positioned between said stiffened portion and a respective one of said fastening points.

4,549,758

GOLF BALL RETRIEVING APPARATUS

Eli Meshulam, 271 S. Citrus Ave., Los Angeles, Calif. 90036

Filed Feb. 21, 1984, Ser. No. 582,024

Int. Cl.⁴ A63B *47/02*

U.S. Cl. 294—19.2 **11 Claims**

1. A golf ball retrieving apparatus for retrieving golf balls from water hazards, comprising:

(a) an elongated handle having an upper portion and a lower portion; and

(b) a ball engaging means for retrieving and entrapping the golf balls, said means comprising:

(i) a hollow body connected to said lower portion of said handle, said body having opposed side openings adapted to receive golf balls therethrough for entrapment within said body and a plurality of smaller spaced apart apertures adapted to permit the flow of fluid therethrough; and

(ii) a pair of outwardly extending guide means connected to said hollow body for guiding the travel of golf balls in a direction toward said side openings in said body, said

means having a plurality of spaced apart apertures adapted to permit the flow of liquid therethrough.

4,549,759

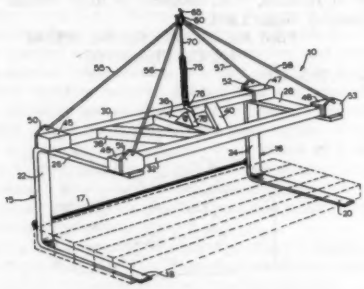
FORKLIFT-TYPE LIFTING APPARATUS

Aubrey A. Fowler, Jr., Fairmont, N.C., assignor to Joseph W. Walker, Fayetteville and Southeastern Crane Fork, Richmond County, both of, N.C.

Filed Apr. 21, 1983, Ser. No. 487,319

Int. Cl.⁴ B66C *1/22*

U.S. Cl. 294—67.2 **2 Claims**



1. A forklift-type lifting apparatus for use with overhead cranes, hoists, or the like, comprising:

(a) a pair of C-shaped claws, each said C-shaped claw having a normally-horizontally positioned tongue member for load support, a vertical backrest member and overlying and parallel to said tongue member a frame bar member;

(b) a frame structure mounted on and secured to the frame bar members of said claws and serving to laterally space said claws such that said claws assume essentially parallel positions and are held in a rigid secured position on said frame structure;

(c) four cable attachments provided at the four outer corners of said frame structure above said claws;

(d) a set of four main lift cables of fixed length, each said main lift cable being attached at one end to one of said cable attachments and at the opposite end to a lift connector providing means for interconnecting said opposite end of said four main lift cables to a single lifting cable;

(e) a central cable structure comprising an interconnected hook, spring member and capable of fixed length, said cable structure having one end attached to said connector and the opposite end terminating in said hook; and

(f) a bracket member located on said frame substantially at the point of balance and having an opening for releasably receiving said hook, the length of said main cables, the length of said central cable structure cable and the force of said spring member being selected such that said forklift-type lifting apparatus when unloaded with said hook installed in said bracket can be supported solely by said central cable structure and maneuvered around said point of balance preparatory to loading on uneven surfaces and when said hook is removed from said bracket or left in said bracket said forklift-type lifting apparatus when loaded is adapted to lift the load through the lift support provided by said four main cables.

4,549,760

DEVICE FOR GRIPPING AND HOISTING PACKED SACKS

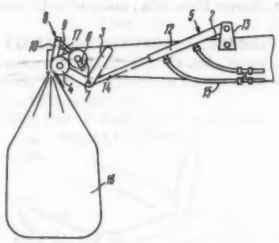
Leonid P. Minenko; Evgeny V. Belikov; Oleg V. Bobryshev, all of Rostov-na-Donu; Lev M. Klyatis, Moscow; Ivan K. Mescheryakov, Rostov-na-Donu; Viktor G. Osipov, Moscow; Mikhail I. Osher, Rostov-na-Nonu, and Nikolai P. Plyakin, Rostovskaya, all of U.S.S.R., assignors to Tsentralnaya Experimentalno-issledovatelskaya Konstruktorsko-Tekhnologicheskaya Laboratoria Khimizatsii Selskogo Khozyaistva, Moskovskaya, U.S.S.R.

Filed Mar. 8, 1984, Ser. No. 587,538

Claims priority, application U.S.S.R., Jun. 6, 1983, 3595899

Int. Cl.[4] B66C *1/42, 1/10*

U.S. Cl. 294—88 **20 Claims**



1. A device for gripping and hoisting packed sacks, said device comprising:

a contrivance for mounting said device onto a hoisting machine;

load bearing members each having two ends, one of said two ends for each of said load bearing members being rigidly coupled to the contrivance for mounting said device onto said hoisting machine, slots defined in the other free ends of the load bearing members, the longer faces of said slots are in a position of angularity with end faces of said load bearing members;

vertical plates hinged on said load bearing members;

a first rod rigidly fixed by its ends in said vertical plates;

a second rod mounted parallel to said first rod in said slots of said load bearing members;

an actuator for imparting a turning motion to said vertical plates; and

a mechanism for restricting the load upon said actuator that imparts turning motion to the vertical plates, said mechanism being mounted on said load bearing member and being kinematically associated with said second rod.

4,549,761

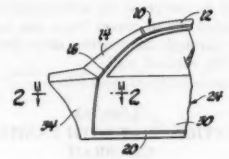
VEHICLE BODY SEALING ARRANGEMENT

David N. Lee, Almont, and William M. Tanner, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 2, 1984, Ser. No. 626,770

Int. Cl.[4] B62D *27/04*

U.S. Cl. 296—206 **3 Claims**



1. A vehicle body sealing arrangement for sealing the space between a door frame and the edge portion of a vehicle body door and concealing from view the portion of the inner wall of the door between the termination of the trim on the inner wall and the edge portion of the door comprising, in combination,

a weatherstrip carrier mounted on the door frame,

a primary weatherstrip mounted to the carrier and engageable with the edge portion of the door to seal the door to the door frame,

a closeout strip including a deflectable lip portion, and

means mounting the closeout strip to the carrier adjacent to the weatherstrip, the lip portion of the closeout strip extending from the carrier in concealing relationship over the weatherstrip and into deflectable engagement with the trim on the inner wall of the door to conceal both the weatherstrip and the area of the inner wall of the door between the termination of the trim and the weatherstrip.

4,549,762

ARRANGEMENT FOR DISCHARGING HOT AIR FROM THE ENGINE COMPARTMENT OF MOTOR VEHICLES

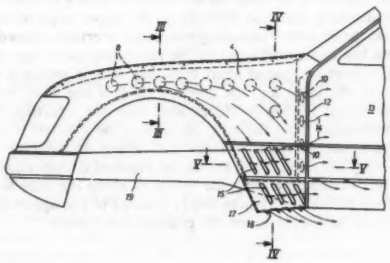
Gerhard Burk, Sindelfingen, and Wolfgang Rau, Renningen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jun. 14, 1984, Ser. No. 620,727

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1983, 3321804

Int. Cl.[4] B60K *11/00*

U.S. Cl. 296—208 **5 Claims**



1. An apparatus for discharging hot air from an engine compartment of a motor vehicle having an internal combustion engine disposed in a forward portion thereof, a quarter panel positioned to extend along a side portion of the engine compartment, an elongated wheel well panel situated intermediate the engine compartment and the quarter panel, a wheel well roof member coupled to the quarter panel and to the wheel

well panel to form a cavity therebetween, a vehicle door in proximity to the engine compartment, the door having an edge positioned in proximity to the quarter panel to form a vertical door gap therebetween, and a substantially vertical wall adjacent to the edge of the door, the vertical wall being in communication with the wheel well panel and the quarter panel, the apparatus comprising:

a plurality of air inlets in the wheel well panel to permit heated air to travel from the engine compartment into the cavity, and

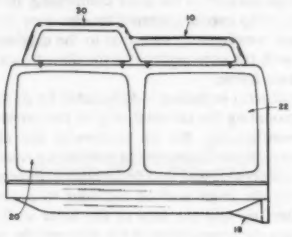
a plurality of air outlets in the substantially vertical wall to permit heated air to travel from the cavity to the surroundings through the vertical door gap defined by the door and the vertical wall.

4,549,763

TRANSPORTATION SEAT WITH VANDAL-RESISTANT GRABRAIL

Larry A. Wilkerson, Comstock Park, Mich., assignor to American Seating Company, Grand Rapids, Mich.

Continuation of Ser. No. 295,681, Aug. 24, 1981, abandoned.
This application Feb. 4, 1984, Ser. No. 576,197
Int. Cl.[4] A47C *4/52*
U.S. Cl. 297—183 **7 Claims**



1. A one piece, vandal resistant grabrail for a mass transportation seat that includes a seat portion and a seat back having an upper edge, the grabrail being releasably mounted on the upper edge of the seat back, the grabrail comprising an elongated resiliently deflectable base formed of a flexible, resilient material that extends across the upper edge of the seat back, a rail spaced above the base, and at least three legs extending downwardly from the rail and interconnecting the rail to the base, the legs including a pair of outer legs at opposite ends of the rail and an inner leg positioned between the outer legs, the base including a plurality of apertures therethrough at spaced intervals along the base, the apertures receiving fastener means for attaching the base securely to the upper edge of the seat back, the apertures including two outer apertures spaced apart from but closely adjacent to the respective outer legs and an inner aperture spaced apart from but closely adjacent to the side of the inner leg, the configuration of the base, with the base being resiliently deflectable and the apertures being spaced apart from the legs, permitting the grabrail to deflect upon impact to absorb energy and reduce deceleration loads, while at the same time causing the reduced deceleration loads to be distributed among the fasteners along the base so as to induce the base to remain firmly secured to the upper edge of the seat back even when the grabrail is deflected.

4,549,764

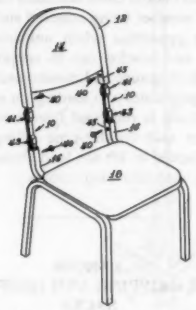
FLEXIBLE CHAIR BACK

Edmundo Haedo, Chicago, Ill., assignor to K. L. Spring & Stamping Corporation, Chicago, Ill.

Filed Sep. 14, 1983, Ser. No. 532,216
Int. Cl.[4] A47C *3/00*
U.S. Cl. 297—296 **10 Claims**

1. A spring element for use with a chair and insertable into the ends of a separated backrest frame support for allowing flexuous movement of the upper portions of said backrest frame support with respect to the lower portions thereof, said spring element comprising:

a pair of elongate spring members joined together with their medial portions in abutting relationship and having end portions bent outwardly in generally parallel spaced apart



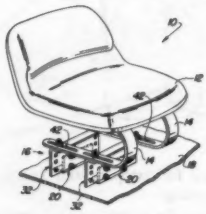
relationship to form enlarged sections fittable with a different end of said separated backrest frame support, whereby the midsection of said spring element is resilient permitting flexuous movement of the upper portions of said backrest frame with respect to the lower portions thereof.

4,549,765

BRACKET ASSEMBLY FOR ADJUSTABLY MOUNTING A SEAT

John J. Hoch, Beaver Dam, Wis., assignor to Deere & Company, Moline, Ill.

Filed Dec. 27, 1983, Ser. No. 565,313
Int. Cl.[4] A47C *1/02*
U.S. Cl. 297—311 **13 Claims**

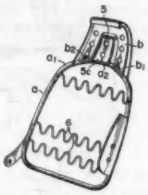


8. A bracket assembly for supporting a seat, comprising: a support frame including a pair of transversely extending, longitudinally spaced upright mounting surfaces, each having a plurality of vertically spaced sets of mounting holes therein; a bracket means defined by first and second transverse brackets, each having first and second legs of different lengths joined together to form a right angle with the shorter of the first and second legs being provided with at least one set of mounting holes arranged for selectively mating with said plurality of spaced sets of mounting holes provided in said upright mounting surfaces, and with the longer of the first and second legs being provided with a set of mounting holes arranged for selectively mating with selected ones of said plurality of spaced sets of mounting holes provided in said upright mounting surfaces; and a plurality of fasteners releasably securing one of the first and second legs of each of the transverse brackets to a selected one of the pair of upright mounting surfaces.

4,549,766
VEHICLE SEAT HEADREST

Takaichi Nishino, Tokyo, Japan, assignor to Tachikawa Spring Co., Ltd., Tokyo, Japan

Filed Aug. 31, 1982, Ser. No. 413,503
Int. Cl.⁴ A47C 7/36
U.S. Cl. 297—396 4 Claims

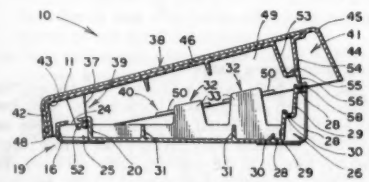


1. A vehicle seat comprising a seat back frame in the form of a generally curved pipe having a central upper portion and a headrest panel integrally connected to said frame, said headrest panel being secured to front and rear sections of said pipe, said head rest panel comprising a unitary metal plate including at least one rear member secured to said rear pipe section and at least one forwardly extending member attached to said pipe front section, at least one of said members being provided with lower recesses which abut an upper surface of said pipe, said panel being integrally connected to said seat back frame by welding said members to said pipe, said rear and forwardly extending members being secured to said curved pipe at different vertical extents, one of said at least one members comprising two spaced portions attached to said pipe at horizontally spaced locations, the other of said at least one members being attached to an opposed side of said pipe between said spaced locations, none of said members extending below said pipe.

4,549,767
ADJUSTABLE FOOT SUPPORT

James F. Hampshire, Stephens City, Va., and Beverly L. Wilkinson, Cincinnati, Ohio, assignors to Rubbermaid Commercial Products Inc., Winchester, Va.

Filed Dec. 2, 1983, Ser. No. 557,455
Int. Cl.⁴ A47C 9/12
U.S. Cl. 297—439 6 Claims

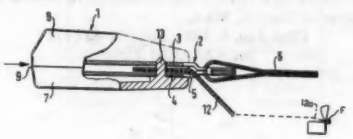


1. An adjustable foot support comprising a unitary supporting platform, and a unitary base with a plurality of stepped adjustment brackets at one end thereof, said brackets extending upwardly from said base and each of said brackets having a plurality of stepped horizontal channels, means extending downwardly from said platform to selectively cooperate with said stepped channels so that said platform is selectively inclined with respect to said base, and hinge means connecting said supporting platform with said base so that said platform is movably attached to said base, said hinge means including a plurality of overhangs carried by a plurality of walls extending upwardly from said base, said overhang and walls forming a partially enclosed socket, and hinge pin means depending from said platform and located within said socket, said pin means freely movable within said socket and retained therein.

4,549,768
BELT LOCK FOR A SAFETY BELT

Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to Repa Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

Filed Nov. 23, 1983, Ser. No. 554,774
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1982, 3243643
Int. Cl.⁴ B60R 21/00
U.S. Cl. 297—468 6 Claims

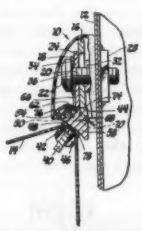


1. A belt lock for a safety belt with flexible pulling means for arrangement in a motor vehicle, comprising a belt lock having a metallic lock frame with two parallel, spaced plates in a lock housing, a flexible fitting having one end fastened to the belt lock and the other end of the fitting fixed to a vehicle part, and flexible pulling means for holding the belt lock which is not connected to the safety belt in a predetermined, easy-to-grab position, connected at one end firmly and undetachably to the metallic lock frame in the lock housing and the other end of the flexible pulling means fixed to a vehicle part, a fastening post for the pulling means being formed on the lock housing from which the post extends and is supported in an opening of at least one of the plates.

4,549,769
BELT CLAMPING GUIDE LOOP

Regis V. Pilarski, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 20, 1984, Ser. No. 632,958
Int. Cl.⁴ B60R 21/10
U.S. Cl. 297—483 2 Claims



1. A restraint belt guide loop assembly adapted to be mounted on the pillar of a vehicle body and slidably receive the belt from a locking retractor and deflect the belt diagonally across the occupant shoulder comprising:

a first frame having a slot therethrough defined by an anvil surface over which the belt slides, and a second frame;

means pivotally mounting the first and second frames on the pillar and additionally mounting the first frame for limited vertical movement relative to the second frame;

a clamping bar pivotally mounted on the second frame for pivotal movement between a normal position spaced away from the anvil surface of the first frame by a distance greater than one belt thickness and a clamping position clamping the belt against the anvil surface of the first frame;

spring means acting to establish the first frame and the clamping bar at their respective normal positions to enable free sliding movement of the belt through the first frame and being yieldable upon imposition of an occupant re-

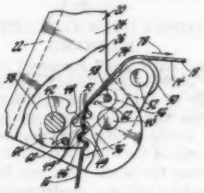
straint load on the first frame by the belt whereby the first frame moves vertically relative to the second frame and thereby induces a forced pivotal movement of the clamping bar into clamping engagement with the belt whereby the clamping bar forcibly clamps the belt against the anvil surface.

4,549,770

BELT CLAMPING GUIDE LOOP

Gary R. Kurtti, East Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 6, 1984, Ser. No. 637,871
Int. Cl.[4] A62B *35/02*
U.S. Cl. 297—479 **4 Claims**



1. A restraint belt guide loop assembly adapted to be mounted on a vehicle body and slidably receive the belt from a locking retractor and deflect the belt diagonally across the occupant shoulder comprising:

a mounting bracket mounted on the vehicle body;

first and second belt eccentric clamping bars independently pivotally mounted on the mounting bracket, and having clamping faces which are movable upon rotation of the belt clamping bars between positions allowing free passage of the belt therebetween and clamping positions in which the belt is clamped therebetween;

said first belt clamping bar having an associated reaction arm traversed by the belt and effective to induce forced rotation of the first belt clamping bar upon imposition of occupant restraint load upon the belt; and

means interconnecting the first and second belt clamping bars to coordinate the rotational movement thereof whereby the forced rotation of the first belt clamping bar by the occupant restraint load induces coordinated rotation of the second belt clamping bar to move the respective eccentric belt clamping faces of the first and second belt clamping bars into belt clamping proximity with each other to clamp the belt therebetween against further movement through the guide loop assembly.

4,549,771

COMPOSITE STRUCTURE AND IN PARTICULAR A SLIDE FOR A WINDOW RAISER OF AN AUTOMOBILE VEHICLE

Denis Crossonneau, Sully-sur-Loire, France, assignor to Compagnie Industrielle de Mecanismes, France

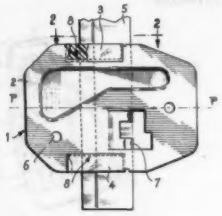
Continuation of Ser. No. 475,287, Mar. 14, 1983, abandoned. This application Mar. 22, 1985, Ser. No. 696,954
Claims priority, application France, Mar. 22, 1982, 82 04819
Int. Cl.[4] F16C *29/02*
U.S. Cl. 308—3 R **8 Claims**

1. A slide assembly for a window raiser of an automobile comprising:

(a) a base plate having opposite edge surfaces having a thickness dimension, each edge surface defining a generally rectangular notch therein, one side of each notch having a "V" shape with its apex extending inwardly of the notch;

(b) a sliding shoe mounted in each notch, each shoe having a generally rectangular cross-section and defining a groove extending about at least a portion of its periphery, the groove having a width greater than the thickness dimension of the edge surfaces so as to be slidably received therein;

(c) retaining means defined by the sliding shoe and contacting the "V" shaped side of the notch to prevent translation movement of the shoe with respect to the base plate, but



permit rotational movement of the sliding shoe about the apex of the "V" shaped side of the notch; and,

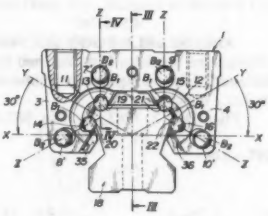
(d) a substantially rectilinear rail slidably inserted through a portion of the sliding shoes to prevent their rotation relative to the base plate.

4,549,772

LINEAR SLIDE BEARING

Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa Setagaya-ku, Tokyo, Japan

Division of Ser. No. 604,113, Apr. 26, 1984,. This application Jan. 4, 1985, Ser. No. 688,831
Claims priority, application Japan, May 10, 1983, 58-80024; May 13, 1983, 58-83827
Int. Cl.[4] F16C *29/06*
U.S. Cl. 308—6 C **6 Claims**



1. A linear slide bearing comprising:

an integral main body with a channel-like cross-section constituted by left and right skirt portions depending from a solid portion and a central cavity formed between said skirt portions, said main body having a pair of race receiving grooves formed in the opposing surfaces of said skirt portions and opening to said central cavity, and non-loaded ball passages constituted by bores formed in said solid portion of said main body;

a pair of bearing races constituted by arcuate members having a semi-circular cross-section, each of said bearing races being provided in its inner surface with a pair of loaded ball grooves;

a track shaft received in said central cavity of said main body and provided at its both shoulder portions with ribs extending along he length thereof, said track shaft being provided at the upper and lower sides of each rib with loaded ball grooves corresponding to said loadd ball grooves in the adjacent bearing race;

a pair of end covers adapted to be attached to both longitudinal ends of said main body so as to straddle said track shaft, each of said end cover being provided in its inner surface with ball turning grooves for connecting said

loaded ball grooves in said bearing races and in said track shaft to corresponding non-loaded ball grooves in said main body, and race retaining grooves for retaining adjacent ends of said bearing races; and

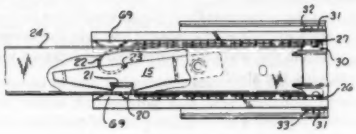
balls adapted to be recirculated through endless ball passages constituted by loaded ball passages formed by said loaded ball grooves in said bearing races and said track shaft, non-loaded ball passages presented by said non-loaded ball grooves in said main body and said ball turning grooves formed in respective end covers.

4,549,773

BALL BEARING SLIDE WITH REMOVABLE AND LOCKABLE INNER SLIDE MEMBER

John E. Papp, Anaheim, and Antony S. Reed, Whittier, both of Calif., assignors to Standard Precision, Inc., Santa Fe Springs, Calif.

Filed Oct. 7, 1983, Ser. No. 540,006
Int. Cl.⁴ F16C *21/00*; A47B *88/00*
U.S. Cl. 308—3.8 **22 Claims**



1. In a lock-out and disconnectable slide mechanism for locking a telescoping slide in an extended position while permitting the slide to be disconnected, said slide mechanism comprising:

a first slide member having two inwardly-facing, parallel grooves formed along the edges thereof, said first slide member having an outer end from which the slide telescopes and an inner end toward which the slide retracts;

a ball bearing retainer having a plurality of ball bearings held therein, said retainer being movable within and along said first slide member and being positioned to hold the ball bearings in two axial rows one of said rows being held along and against the first of said two parallel grooves and the other of said rows being held along and against the second of said parallel grooves;

an inner slide member having two outwardly-facing parallel grooves formed along the edges thereof, said inner slide member being slideable along the interior of the first slide member and having the ball bearings touching the grooves thereof; wherein the improvement comprises:

an elongated latch member having an actuating end and a pivot end pivotally held by said inner member, said latch member having a first stop surface formed therein, said first stop surface being about normal to the longitudinal axis of said inner member and positioned between the pivot end and the actuating end, said first stop surface facing the outer end of said first slide member and having a lower terminus at a point farthest from the longitudinal axis of said latch member, and said latch member has a second stop surface facing generally in the direction of the first stop surface and spaced therefrom a distance about equal to the width of the stop means held by said first member, said latch member having an actuating arm at the actuating end of the latch member; and

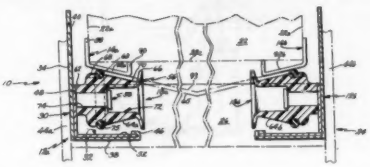
stop means held by said first member, said stop means comprising a protrusion positioned so that it touches said stop surface of said latch member when said inner member is pulled outwardly from said first member.

4,549,774

DRAWER SLIDE APPARATUS

Walter L. Bessinger, Grand Haven, and Keith A. Hoffman, Hudsonville, both of Mich., assignors to Knape & Vogt Manufacturing Company, Grand Rapids, Mich.

Filed Feb. 22, 1983, Ser. No. 468,330
Int. Cl.⁴ H47B *88/00*; F16C *21/00*
U.S. Cl. 308—3.8 **10 Claims**



1. A drawer slide assembly comprising:

first and second rollers adapted to be rotatably supported on opposite sides of a cabinet, each of said rollers including a load-bearing, generally frustoconically shaped portion, each of said rollers having an inwardly directed smaller end, said frustoconically shaped portions of said first and second rollers thereby defining a portion of a first upwardly opening V centered in the cabinet;

first and second drawer rails adapted to be fixedly secured to opposite sides of a drawer and each including a riding surface supported on said first and second frustoconically shaped roller portions, respectively, said first and second riding surfaces being directly under the drawer and defining a portion of a second upwardly opening V centered on the drawer, the legs of said first and second Vs being generally parallel when the drawer is in a centered position with respect to the cabinet, said riding surfaces being free to move with respect to said rollers in a direction generally parallel to the axes of rotation of said rollers as said rails ride on said rollers, whereby the drawer is free to travel transversely within the cabinet to be guided to the centered position with respect to the cabinet as said rails ride on said rollers; and

said roller further including lateral stop means for limiting the lateral travel of the drawer from the centered position, said lateral stop means including an annular flange extending radially from the smaller end of each of said frustoconically shaped roller portions, said annular flanges limiting the lateral movement of said rails along said frustoconically shaped roller portions.

4,549,775

TAPE CASSETTE HOLDER

Donald F. Carter, South Pasadena, Calif., assignor to Anthony J. Foto, Pasadena, Calif.

Filed Nov. 19, 1982, Ser. No. 443,020
Int. Cl.⁴ B65D *85/672*
U.S. Cl. 312—15 **12 Claims**

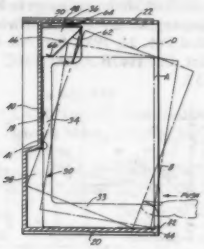
1. A holder for tape cassettes comprising:

(a) a plurality of side-by-side compartments, each for receiving and storing a tape cassette, each compartment having an entrance;

(b) pivot means in each compartment for engaging the tape cassette;

(c) spring means in each compartment for bearing against a wall of the cassette and urging the cassette against the holder while the cassette is in a stored position and for bearing on the back of the cassette to urge the cassette outwardly of the compartment in an alternate, partially withdrawn position, the wall being different from the back, the spring means and the pivot means cooperating to aid in effecting canting of the cassestte from the stored

position to the partially withdrawn position upon the application of a force on the cassette by a user of the



holder that cants the cassette outwardly with a corner of the cassette free of the compartment.

4,549,776

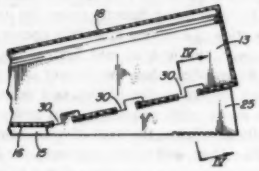
CONNECTING MEMBER FOR CONNECTING TWO COMMUNICATIONS TERMINAL UNITS

Robert B. Isaacs, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Apr. 16, 1984, Ser. No. 600,948

Int. Cl.[4] H04M *1/02*

U.S. Cl. 312—111 **4 Claims**



1. An assembly of two communications terminals in side-by-side position, a side wall of one terminal in contact with a side wall of the other terminal; each said side wall having a recess at a lower part, each recess extending inward from the side wall and having an overhanging upper wall; the recesses being contiguous to form a unitary space having a planar top surface, spaced side surfaces and an open bottom; a plurality of slots in each said upper wall, said slots arranged in at least one row in each said upper wall; a connecting member positioned in said space, said connecting member comprising an elongate member having top and bottom surfaces and parallel side surfaces; a plurality of hook-shaped members extending up from said top surface, said hook-shaped members being in rows and extending through said slots; each hook-shaped member having a stem portion extending through a slot and a projecting portion extending substantially normal to said stem portion, the projecting portions all extending in the same direction and extending over and in contact with an upper surface of said upper wall; the side surfaces of the elongate member being in close proximity with said spaced side surfaces of said space, and the top surface of the elongate member being in contact with said planar top surface of said space.

4,549,777

LIBRARY SHELF SUPPORT SYSTEM

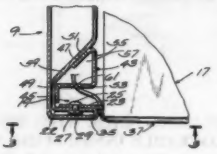
Michael D. Schindler, Fort Atkinson, Wis., assignor to Spacesaver Corporation, Fort Atkinson, Wis.

Filed May 16, 1984, Ser. No. 610,770

Int. Cl.[4] A47B *53/00*

U.S. Cl. 312—198 **4 Claims**

1. In combination with a mobile storage system unit having a base, at least two spaced upright frames joined to the base, at least one storage shelf suspended between the frames and repositionable therealong, and an electrical safety device mounted to the shelf for controlling the mobile storage system and having wire leads, an elongated vertically disposed guide channel member fastened to an upright frame, the channel member defining a vertical passage extending the length thereof for protecting and storing the wires, the channel mem-



ber defining at least one vertically disposed slot adapted to provide access to the vertical passage for the wires and being located in the vicinity of the shelf having the safety device mounted thereon,

so that the wires pass from the safety device through the slot with a minimum of exposure and into the vertical passage wherein the wires are stored and withdrawn when repositioning the shelf.

4,549,778

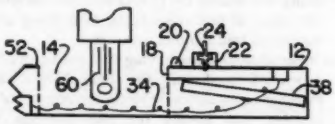
ELECTRICAL SOCKET COVER

Fred D. Price, 107 Woodland Forest, Winfield, W. Va. 25213, and R. Neal Pierce, Sissonville, W. Va., assignors to Fred D. Price, Winfield, W. Va.

Filed Apr. 2, 1984, Ser. No. 595,617

Int. Cl.[4] H01R *13/453*

U.S. Cl. 339—40 **15 Claims**



1. An electrical socket cover assembly adapted to attach to and cover an electrical socket assembly of a type having at least one electrical outlet, comprising:

(a) a cover plate having at least one aperture there through adapted to expose the electrical outlet,

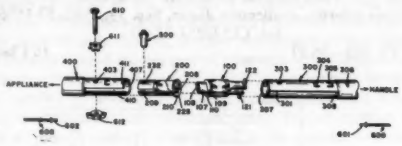
(b) door means for covering said aperture, said door means being slidably connected to said cover plate and adapted to slide between at least a first aperture covering position, and a second aperture exposing position, and

(c) releasable locking means for locking said door means into said first aperture covering position, said locking means capable of being moved between a first position and a second position where moving said locking means from said first position to said second position allows said door means to slide relative to said cover plate from said first aperture covering position to said second aperture exposing position.

4,549,779
TWO-PART HANDLE ASSEMBLY FOR ELECTRICAL APPLIANCE

Francis S. Gromek, Linden, and William F. Haines, Sr., Sea Bright, both of N.J., assignors to New Regina Corporation, Rahway, N.J.

Filed Jan. 28, 1983, Ser. No. 461,785
Int. Cl.⁴ H01R *13/639*
U.S. Cl. 339—58 **3 Claims**



1. A longitudinal hollow handle for an electrical appliance and comprising in cooperative combination:

(a) first and second handle portions configured for limited and polarized telescoping engagement;

(b) first and second electrical connectors associated with and interior of said first and second handle portions, respectively, for completing an electrical connection therebetween when said first and second handle portions are positioned in said polarized telescoping engagement;

(c) first means for locking said first electrical connector within said first handle portion with a first predetermined and polarized orientation with respect thereto so that only limited relative rotational and/or longitudinal motion therebetween is possible;

(d) second means for locking said second electrical connector within said second handle portion with a second predetermined and polarized orientation with respect thereto so that only limited relative rotational and/or longitudinal motion therebetween is possible;

(e) third means for locking said second electrical connector within said second handle portion as aforedescribed;

(f) fastening means penetrating both of said first and second handle portions and said first electrical connector when said first and second handle portions are positioned in limited and polarized telescoping engagement for retaining said first and second handle portions in a predetermined relationship; and

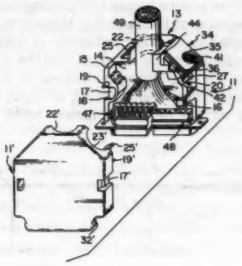
(g) a sleeve associated with said first electrical connector for providing a passageway for said fastening means and for concomitantly preventing electrical conductors associated with said first electrical connector from interfering with the placement of said fastening means, said sleeve comprising a separate part, and said sleeve including spring wing members for locking said sleeve in association with said first electrical connector.

4,549,780
ELECTRICAL CONNECTOR WITH ALTERNATIVE CABLE EXITS

Carlo Bertini, and Aldo Bruni, both of Turin, Italy, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 27, 1984, Ser. No. 635,075
Int. Cl.⁴ H01R *13/595*
U.S. Cl. 339—107 **6 Claims**

1. An electrical connector housing assembly comprising a body having a terminal receiving face and a cable receiving face remote from the terminal receiving face, the cable receiving face being formed with two spaced apart apertures having axes inclined at an angle to each other to provide cable lead out openings extending in different directions, a plug having adjustable cable clamping means, a cable clamping surface formed in the housing adjacent each opening, the plug being releasably receivable in either lead out opening with the cable

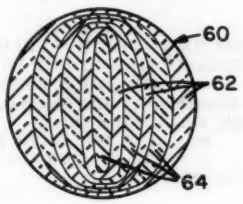


clamping means operable to clamp a cable extending through the other opening against the cable clamping surface.

4,549,781
POLARIZATION-RETAINING SINGLE-MODE OPTICAL WAVEGUIDE

Venkata A. Bhagavatula, and Daniel A. Nolan, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jun. 1, 1983, Ser. No. 499,898
Int. Cl.⁴ G02B *5/172*
U.S. Cl. 350—96.30 **4 Claims**



1. An optical fiber capable of operating polarization stabilized or single polarization, single-mode at a wavelength λ, said fiber having a core member surrounded by a cladding member having an average refractive index lower than the average refractive index of said core member, said fiber being characterized in that at least said core member comprises a plurality of transparent glass laminae, each of said laminae having a refractive index different from that of the adjacent laminae, the thickness of each of said laminae being approximately equal to or less than the wavelength λ, the refractive index of one type of said core laminae being less than the average refractive index of said cladding.

4,549,782
ACTIVE OPTICAL FIBER TAP

Stewart E. Miller, Locust, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 6, 1983, Ser. No. 501,716
Int. Cl.⁴ G02B *5/14;* **H04B** *9/00*
U.S. Cl. 350—96.16 **9 Claims**

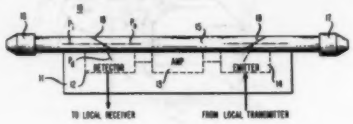
1. An active optical fiber tap comprising:

(a) means for positioning in fiber holding means a portion of an optical fiber adapted for longitudinally guiding first electromagnetic radiation, the portion of the fiber comprising a first region and a second region, the first region comprising means for causing emission of some of the first radiation from the fiber, the second region comprising means for causing coupling of second electromagnetic radiation into the fiber;

(b) means for detecting at least some of the first radiation emitted from the fiber portion, the detecting means having an output;

(c) radiation source means comprising means for modulating the emission of the radiation therefrom, the emitted radiation being the second radiation, at least a part of the second radiation to be coupled into the optical fiber;

(d) means for amplifying the output of the detecting means, the amplifying means having an input and an output, the output of the detecting means being connected to the



input of the amplifying means, the output of the amplifying means being connected to the means for modulating the second radiation emission; and

(e) means for extracting an output signal from the optical fiber tap;

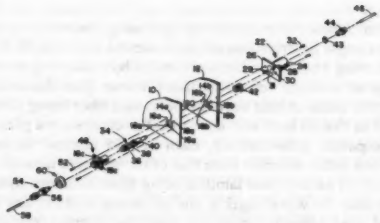
(f) wherein the fiber holding means comprise a semiconductor substrate comprising means for attaching thereto the portion of the optical fiber, and wherein the detecting means, the amplifying means, and the second radiation source means all comprise semiconductor devices integrated into the substrate.

4,549,783

CONNECTOR FOR OPTICALLY CONNECTING AN ELECTRICALLY-ENERGIZABLE LIGHT SOURCE TO AN OPTICAL FIBER

Richard Schmachtenberg, III, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 6, 1983, Ser. No. 482,732
Int. Cl.⁴ G02B 7/26
U.S. Cl. 350—96.20 **10 Claims**



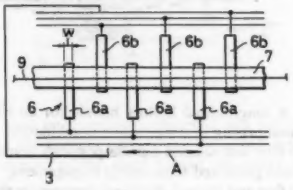
9. In combination, a device for emitting optical energy and an optical fiber for transmitting the optical energy, said device comprising a light source and an electrical driver circuit for energizing the light source, the driver circuit having first and second terminals which, when connected together externally of the circuit, enable the driver circuit to operate and energize the light source but, when not so connected, inhibit operation of the driver circuit and energization of the light source, and said device further comprising a first coupling member in mechanically coupled relationship with said light source and having two terminal portions connected respectively to said terminals of the driver circuit, and said optical fiber being provided at one end with a second coupling member which is mechanically mateable with the first coupling member whereby the optical fiber can be brought into optically coupled relationship with the light source, and the second coupling member having a conductive portion which contacts the terminal portions of the first coupling member when the two coupling members are mechanically connected together, thereby establishing electrical connection between the terminals of the driver circuit.

4,549,784

OPTICAL FIBER-GUIDED SCANNING DEVICE

Toshiyuki Inokuchi, Yokohama, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Sep. 13, 1983, Ser. No. 531,764
Claims priority, application Japan, Sep. 14, 1982, 57-160605
Int. Cl.⁴ G01J 17/00
U.S. Cl. 350—96.27 **16 Claims**



1. An optical writing device for optically writing an image on an imaging surface, comprising:

a substrate;

a plurality of first electrodes provided on said substrate as spaced apart from one another and arranged in the form of an array, each of said first electrodes being transparent at least partly;

means for driving said plurality of first electrodes selectively in accordance with an image signal supplied thereto from an external source;

at least one second electrode disposed generally opposite to said plurality of first electrodes, said second electrode being maintained at a predetermined potential and capable of emitting electrons;

light emitting means provided in contact with or above said plurality of first electrodes, said light emitting means being capable of emitting light when said first electrodes are selectively driven to cause the electrons emitted from said at least one second electrode to impinge thereon; and

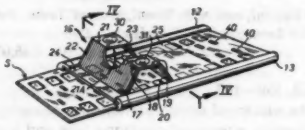
light transmitting means provided as embedded in said substrate, said light transmitting means having one end so located to receive light emitted from said light emitting means and another end so located to direct the light thus received to said imaging surface.

4,549,785

STEREO VIEWER

Jean-Pierre Vitrac, Paris, France, assignor to Stereoscopes Lestrade & Cie., Hautes Pyrenees, France

Filed Apr. 7, 1983, Ser. No. 482,910
Claims priority, application France, Jan. 19, 1983, 83 00777
Int. Cl.⁴ G02B 27/04, 27/22
U.S. Cl. 350—140 **13 Claims**



1. A device for viewing a series of stereoscopic views disposed in pairs in columns on a card, said device comprising a generally flat quadrangular body having an axis of symmetry,

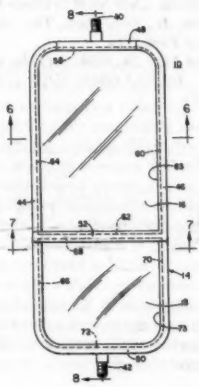
a pair of windows in said body, means defining first and second pairs of channels on the front of said body disposed one on each side of said axis of symmetry, said first pair of channels being configured to enable said card to slide therein and said second pair of channels being superposed on said first pair of channels, a plate including a plurality of flat sections having edges transverse to said pairs of channels, adjacent sections being attached at adjoining transverse edges by hinges, one of said sections including two spaced eyepieces adapted to align with pairs of views in the respective columns of views, said second pair of channels being configured to enable at least part of said plate to slide therein, at least one section of said plate being slidable in said second pair of channels to move said one section to a deployed position in which said eyepieces lie in a plane parallel to and appropriately spaced from said front surface and opposite said windows, and a folded position in which all of said sections of said plate lie flat against the front of said body.

4,549,786

MIRROR ASSEMBLY

Joseph H. Albers, and Christopher J. Albers, both of 3330 E. Kemper Rd., Cincinnati, Ohio 45241

Filed Feb. 7, 1983, Ser. No. 464,661
Int. Cl.[4] G02B *5/10*
U.S. Cl. 350—625 **7 Claims**



1. A mirror assembly which comprises; a gasket member of rubber-like material which includes spaced parallel side strip portions, spaced parallel end strip portions, and a cross strip portion parallel to and spaced between the end strip portions and spanning the side strip portions to form two openings therein, there being lengthwise slot portions in the side strip portions, the end strip portions, and the cross strip portion to form a respective continuous slot in the inner walls around each of the openings; mirror members, each mirror member respectively mounted in a respective opening and in the continuous slot around it; and a rigid case having flange means supporting the side strip portions and the end strip portions and a body supporting the cross strip portion to hold the mirror members and the gasket member in fixed relation to the case.

4,549,787

OPTICAL SHUTTER

Howard M. C. Tanner, Salt Lake City, Utah, assignor to HGM, Inc., Salt Lake City, Utah

Filed Jan. 12, 1984, Ser. No. 570,097
Int. Cl.[4] G02B *5/20, 7/00*
U.S. Cl. 350—315 **7 Claims**

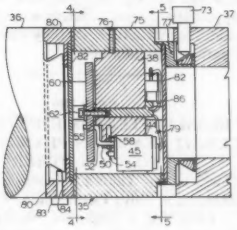
1. A shutter mechanism for employment in a laser system between binoculars and a slit lamp or operating microscope, comprising:

(a) an outer housing providing a hollow interior and a wiring entryway through the wall thereof;

(b) an inner housing within said outer housing, said inner housing being formed with a pair of laterally-spaced, horizontally extending apertures alinged with optical sight paths of binoculars associated with said mechanism and located on a common horizontal centerline, a receptacle formation adapted for receiving a filter shutter drive motor and a shaft mounting hole passing through said inner housing and having its axis parallel to, located between, and aligned with said horizontal centerline;

(c) a filter-mounting shaft rotatably mounted in said shaft mounting hole, said shaft having a cam formed on one end and the opposite end accessible and adapted for mounting another member thereon;

(d) a filter member secured to said shaft opposite end and rotatable therewith, said filter member being formed as an integral thin transparent sheet with an appropriate filtering tint, having filtering sections extending outwardly from a central point about which said filter member rotates with said shaft and adapted when said filter member and shaft are rotated in one direction to cover said pair of apertures and when rotated in an opposite direction to



uncover said pair of apertures and having a slot extending radially outward from said central point and alongside one of said sections;

(e) drive means including a drive motor mounted in said receptacle formation, a gear train driven by said motor and a crank arm driven by said gear train, with the outer end of said crank arm being mounted in said slot to drive said filter member;

(f) a first flange member mounted on one end of said outer housing for releasably receiving binoculars associated with said mechanism;

(g) a second flange member mounted on an opposite end of said housing for releasably receiving a slit lamp or operating microscope fitting associated with said mechanism;

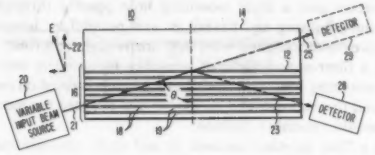
(h) a switch having a contact positioned such that when said filter member and shaft rotate to cover said pair of apertures said cam engages said contact to actuate said switch and when said filter member and shaft rotate to uncover said pair of apertures said cam moves out of engagement with said contact to deactuate said switch; and

(i) operator means associated with said switch for energizing said motor to move said filter to cover said pair of apertures during time periods when operating and effecting treatment with a laser source associated with said mechanism and to uncover said pair of apertures at other times.

4,549,788
INTENSITY OF A LIGHT BEAM APPLIED TO A LAYERED SEMICONDUCTOR STRUCTURE CONTROLS THE BEAM

Daniel S. Chemla, Rumson, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 3, 1983, Ser. No. 455,461
Int. Cl.⁴ G02F *1/29, 1/35*
U.S. Cl. 350—354 **10 Claims**



1. An optical device comprising

an optical interface between a linear optical material and a layered semiconductor structure including layers of materials having different energy band gaps, some layers of the structure being arranged for containing trapped charge;

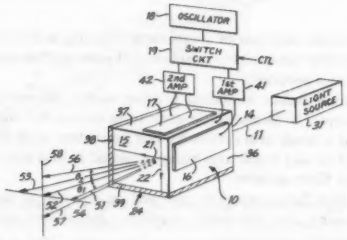
means arranged for applying to the interface, through a path near the critical angle of the interface, an input light beam having a component of an E field polarized normal to the layers; and

means arranged to vary the input light beam for controlling the trapped charge and a dielectric constant of the layered semiconductor structure, thereby changing the direction of the path at the interface.

4,549,789
LIGHT BEAM DEFLECTOR EMITTING A PAIR OF OUTPUT LIGHT BEAMS ON PLANES INTERSECTING TO EACH OTHER

Shigenori Horiuchi, and Takeru Shinohara, both of Yamanashi, Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Feb. 1, 1983, Ser. No. 462,897
Claims priority, application Japan, Feb. 3, 1982, 57-14781
Int. Cl.⁴ G07E *1/33*
U.S. Cl. 350—358 **4 Claims**



1. A light beam deflector comprising a beam generating means for generating an incident light beam having a polarization plane, an acoustic medium having an incident surface for said incident light beam and an output surface for a first and a second output light beam, and acoustic wave supplying means coupled to said acoustic medium for selectively supplying said acoustic medium with first and second acoustic waves having first and second acoustic wave fronts, respectively, said deflector acting to deflect said incident light beam into ei'her one of said first and said second output light beams in response to said first and said second acoustic waves, respectively, said acoustic medium comprising:

an acoustooptic hexahedral body of tellurite glass having said incident and said output surfaces opposite to each other and first, second, third, and fourth side surfaces laid between said incident and said output surfaces, said first side surface being contiguous to said second and said fourth side surfaces and opposite to said third side surface, said acoustooptic hexahedral body having a figure of merit which does not substantially depend on a direction of said polarization plane;

said wave supplying means comprising:

producing means for selectively producing first and second electrical signals;

a first electroacoustic transducer attached to said first side surface and responsive to said first electrical signal for propagating said first acoustic wave into said body; and

a second electroacoustic transducer attached to said second side surface and responsive to said second electrical signal for propagating said second acoustic wave into said body to make said second acoustic wave front intersect said first acoustic wave front at a substantially right angle;

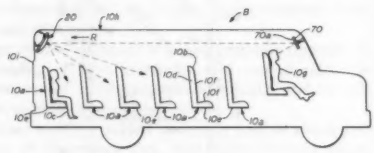
said beam generating means comprising:

beam supply means for supplying said incident light beam to said body with said incident light beam inclined to said first and said second acoustic wave fronts at the Bragg angles determined by said incident light beam and said first and said second acoustic waves.

4,549,790
MIRROR AND MOUNTING DEVICE

Richard J. Harris, Jr., Deer Park, Tex., assignor to Spy Mirrors, Inc., Deer Park, Tex.

Filed May 29, 1984, Ser. No. 614,966
Int. Cl.⁴ G02B *17/06, 7/18*
U.S. Cl. 350—624 **13 Claims**



1. A rear viewing system for allowing a driver to view occupants seated near the rear of a bus, the bus having a rear exit door and interior walls subject to vibration transmitted from an engine comprising:

a mirror;

a backing support member;

attachment means with said mirror and said backing support member for resiliently securing said mirror to said backing support member;

a first mounting bracket further comprising:

a mounting flange, said mounting flange secured to said backing support member;

an L-shaped strut pivotally connected at one end to said mounting flange, and having a mounting surface at its end opposite said pivotal connection, said mounting surface adapted to be mounted to an interior wall at the rear of the bus; and

a second mounting bracket further comprising;

a backing member strut having a mounting segment secured to said backing support member and an adjustment segment disposed substantially perpendicularly to said mounting segment, said adjustment segment formed having an opening therethrough;

a securing strut, having a mounting segment secured to the rear of the bus and an adjustment segment, said adjustment segment of said securing strut formed having an opening; and

securing means with said opening in said adjustment segment of said securing strut and said opening in said adjustment segment of said backing member strut for

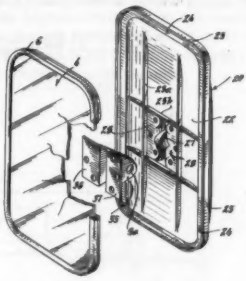
selectively retaining said backing member and securing struts to each other in different positions and thereby facilitating adjustment of the position of said mirror.

4,549,791

REAR VIEW MIRROR WITH REINFORCED EAR MEMBER

Bernard C. Sharp, White Plains, N.Y., assignor to Parker-Hannifin Corporation, Shelton, Conn.

Filed Sep. 1, 1983, Ser. No. 528,471
Int. Cl.[4] G02B *5/08*; B60R *1/00*
U.S. Cl. 350—632 **12 Claims**



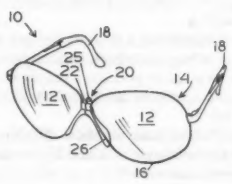
1. In a rear view mirror for vehicles, including a dish-shaped body of sheet-like material presenting about its front side peripheral formations to support a reflecting mirror plate and having thereon a backwardly protruding ear member clampable to a support arm for holding the mirror in viewing position on a vehicle, the improvement wherein said body is a unitary, resilient dish-shaped molding of a tough, weather-resistant organic polymer composition and said ear member is constituted by a backwardly protruded hollowed portion of said molding the hollow of which is closed at the backward end of said portion and opens to the front side of said molding and has fitted thereinto a rigid ear-reinforcing means which comprises at least one angled rigid metal bracket, each said bracket having an arm portion thereof extending inside said hollow and having a base portion thereof extending over and seated against an area of said front side adjacent to said hollowed portion.

4,549,792

ADJUSTABLE NOSE PIECE AND INCORPORATING SUNGLASSES

Franz Dianitsch, Linz, Austria, assignor to Optyl Eyewear Fashion International Corporation, Norwood, N.J.

Filed Mar. 26, 1982, Ser. No. 362,297
Int. Cl.[4] G02C *5/08, 1/00, 5/12*
U.S. Cl. 351—63 **7 Claims**



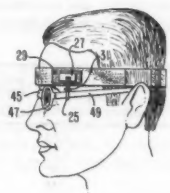
1. Foldable sunglasses comprising:
a pair of viewing lenses;
a pair of rims for engaging and supporting respective said lenses, each rim including portions which extend adjacent a wearer's nose when the sunglasses are worn;
temple means associated with said rims for supporting said sunglasses when worn;
a hinge having hinge members pivotally connected to each other, each hinge member having means for engaging a respective said rim so that said hinge bridges said rims;
a pair of nose pads for resting on a wearer's nose;
attachment means for pivotally attaching each nose pad to a respective said hinge member; and
a pair of ductile wires capable of repeated plastic deformations without rupture, each wire having one end portion attached to a respective nose pad and an opposite end welded to a respective rim, each wire having an intermediate portion which can be plastically deformed to adjust the position of the respective nose pad relative to the respective rim.

4,549,793

HEAD-BAND HOLDER FOR EYEGLASSES

Jong B. Yoon, 6031 Brook Dr., Falls Church, Va. 22044

Filed Feb. 19, 1985, Ser. No. 702,832
Int. Cl.[4] G02C *3/02*
U.S. Cl. 351—156 **18 Claims**



1. A head-band holder for a pair of eyeglasses whose spectacle frame includes rims with lenses, said rims being joined by a nose bridge and said rims being connected in hinged relationship to bows; said head-band holder adjustably mounting and properly positioning such eyeglasses on the head of the wearer so that the lenses are properly spaced or located relative to the wearer's eyes, so that the nose bridge does not drag down on the wearer's nose, so that the rims do not push against the perimeters of the wearer's eye sockets and so that the bows are in substantial balance vis-a-vis the rims, the lenses and the nose bridge; said head-band holder comprising a head band and holder assemblies, said head band being adapted to horizontally encircle the head of the wearer, said holder assemblies having means for releasable retentive engagement and adjustable positioning along the longitudinal axes of the bows of the eyeglasses, said head band and holder assemblies having cooperating fastening means for adjustably positioning said holder assemblies both laterally and vertically relative to said head band, and such adjustable positioning of said holder assemblies relative to said head band together with such adjustable positioning of said holder assemblies along the longitudinal axes of the bows providing such adjustable mounting and proper positioning of such eyeglasses on the head of the wearer.

4,549,794

HYDROPHILIC BIFOCAL CONTACT LENS

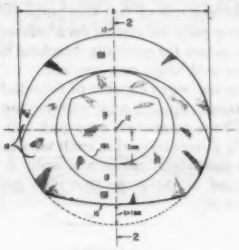
Samuel Loshaek, Chicago, and Malcolm G. Townsley, Park Ridge, both of Ill., assignors to Schering Corporation, Kenilworth, N.J.

Filed May 5, 1983, Ser. No. 491,638
Int. Cl.[4] G02C *7/04, 7/06*
U.S. Cl. 351—161 **3 Claims**

1. A hydrophilic bifocal corneal contact lens comprising a concave rear surface and a convex front surface, said lens in frontal projection comprising:

(a) a perimeter in the form of a truncated circle having a diameter of 14.5 mm, said truncation forming the bottom of said lens and having a height of about 1.5 mm,

(b) a reading segment above the truncation having an upper boundary below the center of said truncated circle, the



distance from said center to said upper boundary along a line bisecting the lens being from 1.5 to 3.5 mm, and

(c) a distant-vision segment located such that the center of said truncated circle is within said distant-vision segment; wherein the prescriptions and maximum thickness at the center of such truncated circle are as follows:

Distant-Vision Prescription, Diopters	Add to Distant Vision Prescriptions to Achieve Reading Prescription, Diopters	Maximum Thickness t At Center, mm
−4	1.25	0.08
−2	1.25	0.08
0	1.25	0.08
+2	1.25	0.14
−4	2.50	0.08
−2	2.50	0.08
0	2.50	0.10
+2	2.50	0.15
+6	2.50	0.24

whereby when said lens is worn by a patient the distant-vision segment covers at least 70 percent of the patient's pupil when the patient looks straight ahead.

4,549,795

POLARIZED GLASS

Robert A. Simms, 6132 N. 77th Pl., Scottsdale, Ariz. 85253

Division of Ser. No. 218,048, Dec. 19, 1980, Pat. No. 4,339,256. This application Mar. 3, 1982, Ser. No. 354,382

Int. Cl.[4] **C03C** *3/26;* **G02B** *5/30, 27/28;* **G02C** *7/10*

U.S. Cl. 351—163 **4 Claims**

1. A polarized unitary glass sheet including in combination elongated metal particles arranged in parallel lines in the glass and confined to a region extending from at least one surface of said unitary sheet to a predetermined depth less than the thickness of said sheet, the remainder of the thickness of said unitary glass sheet which is more than said predetermined depth from the surfaces thereof being free of such elongated metal particles, said lines of elongated metal particles being parallel to said at least one surface.

4,549,796

SYSTEM FOR CONTROLLING THE OPERATION OF A CAMERA AND PROJECTOR

James S. Hurvitz, 2351 Physicians Dr., Baton Rouge, La. 70808

Filed Jul. 22, 1983, Ser. No. 515,877

Int. Cl.[4] **G03B** *19/18*

U.S. Cl. 352—133 **6 Claims**

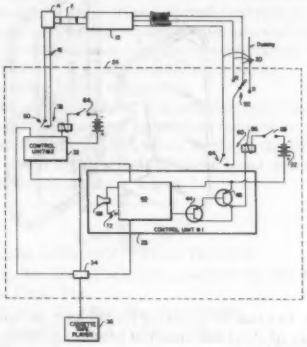
1. Apparatus for controlling and synchronizing the operation of a camera with a motor winder and a projector, where the camera is responsive to wind signals and moving film in the camera from one frame to the next and for exposing the film, and where the projector is responsive to forward signals for moving the film or slides forward to the next frame or slide and is responsive to reverse signals for moving the film or slides backward to the previous frame or slide, said apparatus comprising

means for producing first and second sets of signals interleaved in time, said first set of signals comprising audio signals for broadcasting as a sequence of spoken numerals,

first control means responsive to the first set of signals for producing forward and reverse signals, said first control means including

audio speaker means,

a speaker switch which, when operated, applies said first



set of signals to the audio speaker means for broadcasting, and

detection means for applying a forward or reverse signal to the projector for each numeral in the audio signals received to thereby cause the projector to move the film or slides in the projector to the next or previous frame respectively,

second control means responsive to the second set of signals for producing and applying wind signals to the camera, and

selector switch means having first, second and third positions for applying forward signals to the projector when in the first position, reverse signals to the projector when in the second position, and no signals when in the third position.

4,549,797

METHOL AND APPARATUS FOR POSITIONING MICROFICHE CARD

Yukio Sawano, and Masaru Ono, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 10, 1983, Ser. No. 493,264

Claims priority, application Japan, May 10, 1982, 57-78013

Int. Cl.[4] **G03B** *23/08*

U.S. Cl. 353—27 A **1 Claim**

1. A method of moving a microfiche card including a matrix arrangement of a large number of frame images arranged in X and Y directions so as to position a required frame image to be projected onto a screen in an optical projection path comprising the steps of:

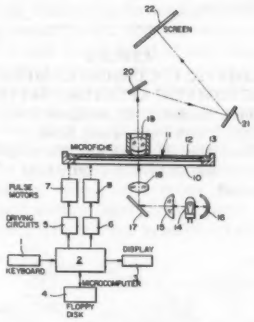
calculating the address numbers NS(X) and NS(Y) of a required frame image in X and Y directions, respectively, using the equations

$$NS(X) = PF(X) - (AS(X)/AF(X)$$

$$NS(Y) = PF(Y) - (AS(Y)/AF(Y)$$

in which AF(X) and AF(Y) represent the total number of frame images on the microfiche card in X and Y direction, respectively; AS(X) and AS(Y) represent the maximum number of pulse signals required to move the microfiche card from a position where the frame image placed at one end of the microfiche card is positioned in the optical projection path to a position where the frame image placed at the opposite end of the microfiche card in X and Y direction, respectively, is positioned in the optical projection path; PF(X) and PF(Y) are the location numbers of said required frame image in X and Y direction, respectively, which designate the position of said required frame image relative to the position of a predetermined datum frame image on the microfiche card;

rounding off the numbers obtained by calculating said equations to the nearest integer so as to make said address numbers NS(X) and NS(Y) integral figures respresenting an integral number of pulse signals;



calculating the numbers of MS(X) and MS(Y) representing the number of pulse signals required to move the microfiche card, in X and Y direction, respectively, from a present position to said required position using the equations

$$MS(X) = NS(X) - OS(X)$$

$$MS(Y) = NS(Y) - OS(Y)$$

in which OS(X) and OS(Y) are integral numbers representing the address numbers in X and Y direction, respectively, of the frame image presently positioned in the optical projection path;

moving a stage on which the microfiche card is placed and held in X and Y direction by means of pulse motors;

driving said pulse motors according to said calculated pulse signal numbers MS(X) and MS(Y), respectively.

4,549,798

APPARATUS HAVING A PICTURE SCREEN FOR THE DISPLAY OF PICTURE SEQUENCES

Rolf Dieckhoff, Marienstrasse 26, D-7050 Waiblingen, Fed. Rep. of Germany

Filed Jul. 25, 1983, Ser. No. 516,771

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1982, 8221237[U]

Int. Cl.⁴ G03B *21/22*

U.S. Cl. 353—72 **3 Claims**

1. A portable apparatus which is collapsible from an operating condition to a storage condition for projecting images from a self-contained projector to a self-contained screen comprising;

a box-shaped section having a back wall with a first cutout therein, a pair of projecting side rests and a pair of projecting end rests,

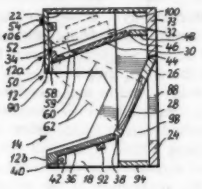
a pair of side walls attached to said side rests by first hinges such that said side walls lie substantially in the same plane as said side rests when said apparatus is in said operating condition and foldable to a position substantially perpendicular to said side rests in said storage condition, said side walls having second cutouts,

a projection screen attached by third hinges to said back wall, said projection screen adapted to display images from said projector, said projection screen lying within said first cutout when said apparatus is in said storage condition,

a cover plate attached to fourth hinges to said projection screen,

a rail connected to said back wall,

a projector shelf attached by fifth hinges to said rail, said



shelf adapted to position said projector, said shelf having a third cutout,

an end wall removably attachable to said side walls when said apparatus is in said operating condition, said side wall further supporting said projection shelf when said apparatus is in said operating condition,

a mirror attached to said end wall for reflecting an image from said projector through said third cutout and onto said screen,

said apparatus characterized in that said side walls, projecting screen, projector shelf, and end walls are collapsible to fit within said box section such that said side walls, projection screen, projection shelf, and end walls lie in stacked parallel planes when said apparatus is in said storage condition.

4,549,799

FOCUS ADJUSTING MECHANISM FOR A CAMERA

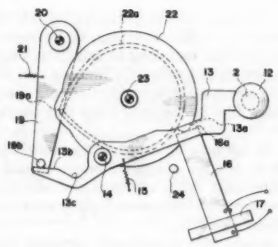
Tetsuhiko Inagaki, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 4, 1984, Ser. No. 596,746

Claims priority, application Japan, Apr. 6, 1983, 58-61374

Int. Cl.⁴ G03B *3/00*

U.S. Cl. 354—400 **7 Claims**



1. A focus adjusting mechanism for a camera, comprising:

a fixed objective lens;

an auxiliary lens to be in and out-of alignment with objective lens for varying the total focal length of an objective;

supporting means for supporting said auxiliary lens and being movable from a first position to a second position via a third position along a plane perpendicular to the

optical axis of said fixed lens, said auxiliary lens being in axial alignment with said fixed lens with said supporting means being at said third position, said auxiliary lens being out of alignment with said fixed lens with said supporting means being at said second position, and said first position being close to said third position;

urging means for urging said supporting means to said second position;

means for restraining said supporting means at said first position;

means for releasing said restraint in response to a shutter release operation;

control means for controlling the movement of said supporting means, said control means including a piezoelectric bender element movable to a transformed position from an initial position when said piezoelectric bender element is transformed by a proper voltage being applied thereto, said control means being movable into the locus of movement of said supporting means for preventing the movement thereof against said urging means when said control means is moved to said transformed position;

a power supply circuit for generating the proper voltage to be applied to said piezoelectric bender element; and

a switching circuit connected between said power supply circuit and said piezoelectric bender element for controlling the application of the proper voltage to said piezoelectric bender element.

4,549,800

COMPACT AUTOMATIC FOCUSING LENS SHUTTER TYPE CAMERA

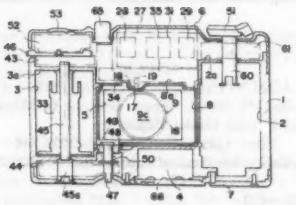
Keisuke Maeda, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Toyonaka, Japan

Filed May 11, 1983, Ser. No. 493,443

Claims priority, application Japan, May 13, 1982, 57-80966; Aug. 30, 1982, 57-150454

Int. Cl.⁴ G03B *3/00*

U.S. Cl. 354—400 **12 Claims**



1. An automatic focusing camera for use with 35 mm size film contained in a film cartridge, said camera comprising:

an objective lens including an axially movable focusing lens;

a film cartridge chamber for housing said film cartridge;

a spool chamber for accommodating a spool for taking up exposed film transported from said film cartridge chamber;

means for forming an exposure aperture (**5**);

a camera obscura disposed between said film cartridge chamber and spool chamber and affording a light path through which objective light passes and reaches said exposure aperture;

a rear cover (**62**) transferable between closed and open positions covering and uncovering said film cartridge chamber, said spool chamber and said exposure aperture, respectively;

a film pressure plate (**64**) provided on said rear cover for resiliently abutting said film located at said exposure aperture;

upper and lower gap forming means (**1***a*) disposed above and below said exposure aperture for forming a gap between said respective gap forming means and said film pressure plate respectively, said gap allowing passage of said film;

upper and lower light tight means (**1***c*) disposed above and below said upper and lower gap forming means for forming a light tight structure together with upper and lower end portions of said rear cover, respectively;

an automatic range finder unit producing an output signal upon range determination;

a viewfinder arranged above the level of said upper light tight means (**1***c*); and

a lens position control mechanism for causing the axial movement of said focusing lens in response to a release operation and stopping the movement thereof in response to the output signal from said automatic range finder unit, said lens position control mechanism being housed in the space delineated by said camera obscura, said viewfinder, said film cartridge chamber, and said spool chamber, and the height of the upper wall (**3***a*) of said spool chamber being lower than that of the upper wall (**2***a*) of said cartridge chamber.

4,549,801

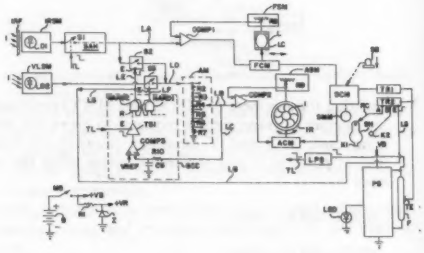
AUTOMATIC FOCUSSING CAMERA WITH AUTOMATIC APERTURE SETTING

Arthur J. Winter, Encino, Calif., assignor to W. Haking Enterprises Limited, North Point, Hong Kong

Filed Mar. 21, 1983, Ser. No. 474,782

Int. Cl.⁴ G03B *3/00, 15/05*

U.S. Cl. 354—403 **22 Claims**



1. In an electrically operated camera having flashlamp means, aperture setting means for controllably setting the aperture over a range of values between limit settings, range determining light sensing means for providing control signals from object-reflected flash light, shutter means for exposing the film when opened, manually operable control means which when operated initially operates said flash lamp means before the shutter means is opened to generate an object-reflected range determining flash of light following which the shutter means is opened, flash lamp actuating means for energizing said flash lamp means to provide a scene-illuminating flash of light when said shutter means is opened and flash lamp illumination of an object is desired, said scene-illuminating flash of light and said range-determining flash of light having a fixed predetermined intensity relationship with respect to each other, said camera further including aperture drive means for effecting a scanning movement of said aperture setting means from an initial position responsively to the operation of said manually operable control means, and aperture setting position-indicating means driven with said aperture setting means for providing progressively varying signals indicative of the instantaneous aperture settings thereof, the improvement wherein said camera further comprises:

single sample-and-hold memory means associated with said first light sensing means and responsive to the output therefrom when receiving the object-reflected range-determining flash of light for storing and holding a range-indicating signal indicative of the output of said range-

determining light sensing means, the stored value of said sample-and-hold memory means for various object ranges and the signals generated by said aperture position-indicating means representing the various setting of said aperture setting means being correlated to the object range value involved for proper exposure of the object to be photographed at the range involved;

aperture setting movement terminating means responsive to said range-indicating signals and said aperture position-indicating means signals for terminating movement of said drive means when the aperture setting involved is that needed for the range indicated by the control signal stored in said sample-and-hold memory means; and

ambient light sensing means for providing a control signal indicative of the ambient illumination of the object to be photographed, and control means responsive to said ambient illumination-indicating control signal indicating a relatively low ambient light condition where there is need for flash lamp illumination for rendering said movement terminating means for said aperture setting drive means responsive to said stored signal of said sample-and-hold memory means so that the aperture setting is determined by the range of the object to be illuminated by flash light, said control means being responsive to said ambient illumination-indicating signal indicating a relatively high ambient illumination where no flash lamp illumination is necessary for rendering said movement terminating means for said aperture setting drive means responsive to the output of said ambient light sensing means, so that the aperture setting is determined by ambient light conditions.

4,549,802

FOCUS DETECTION APPARATUS

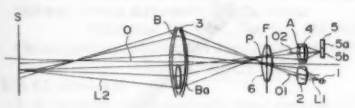
Keiji Ohtaka, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 21, 1984, Ser. No. 652,879

Claims priority, application Japan, Sep. 30, 1983, 57-182190; Oct. 1, 1983, 57-184263

Int. Cl.⁴ G03B *3/00*

U.S. Cl. 354—403 **10 Claims**



1. A focus detection apparatus for detecting a focusing state of an objective lens, including:

light-projecting means;

light-receiving means for generating a signal corresponding to the focusing state of said objective lens by receiving reflected light from an object generated by the projected light from said light projecting means, said light-receiving means having on said sensor or a light receiving lens for forming an image on a sensor and in a vicinity of said sensor in accordance with the light reflected by the object; and

optical means for focusing an entrance pupil of said light receiving lens in a vicinity of a position of an exit pupil of said objective lens, said optical means being located between said objective lens and said light receiving lens.

4,549,803

RECORDING APPARATUS

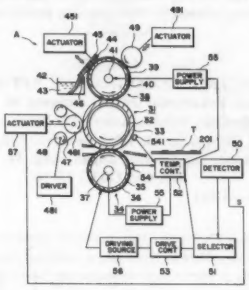
Akio Ohno, Kawaguchi, and Kenji Takeda, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 6, 1984, Ser. No. 597,278

Claims priority, application Japan, Apr. 12, 1983, 58-63075; Oct. 18, 1983, 58-195758

Int. Cl.⁴ G03G *15/20*

U.S. Cl. 355—14 FU **24 Claims**



9. A recording apparatus comprising:

means for forming a toner image;

fixing means including a rotatable fixing member for heating and fixing said toner image onto a recording material;

means for heating said rotatable fixing member;

means for controlling surface temperature of said rotatable fixing member;

means for controlling peripheral speed of said rotatable fixing member; and

selector means for setting the surface temperature and peripheral speed of said rotatable fixing member in accordance with the sort of said recording material, the set temperature and speed being together increased or decreased.

4,549,804

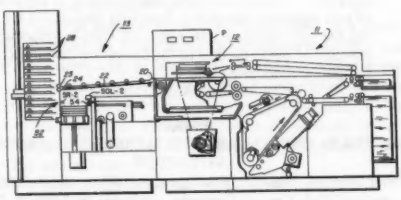
HIGH SPEED DUPLICATOR WITH SORTER/STAPLING APPARATUS AND COPY SET SUPPORTING SYSTEM

Oskar J. Braun, Williamson; Lawrence C. Hubler, Fairport, and Jeffrey L. Sisson, Farmington, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 21, 1983, Ser. No. 566,752

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—14 SH **6 Claims**



5. In a reproduction system having a document handling apparatus adapted to transport individual document sheets from a supply stack to an exposure station and effecting an exposure of each of the document sheets before returning the same to the supply stack, and a processor for reproducing copy sheets of the exposed document sheets, the combination of:

a finishing apparatus adapted to receive collated sets of copy sheets of a set of document sheets and to bind the same,

said apparatus including a binding device having a binding position to which an edge of each copy set is brought for a binding operation,

said finishing apparatus including at least one coupling station whereat collated copy sheets are collected, set transport means for moving a completed copy set from said compiling station to said binding device and having a support member reciprocably movable in a generally horizontal plane and upon which a completed copy set is supported during transporting of the copy set from said compiling station to said binding position.

4,549,805

ELECTROPHOTOGRAPHIC APPARATUS

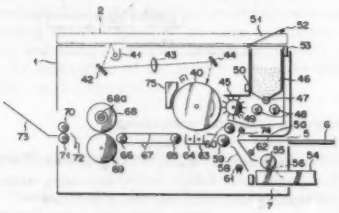
Akiro Iimori, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 22, 1983, Ser. No. 525,489

Claims priority, application Japan, Aug. 31, 1982, 57-150964

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—3 SH **7 Claims**



1. An electrophotographic apparatus comprising:

a photoconductive member;

means for charging said photoconductive member;

means for exposing said photoconductive member to form a latent image of a document pattern on said photoconductive member;

means for developing said latent image on said photoconductive member into a visual image;

means for transferring said visible image onto a paper sheet;

manual paper feeding means for manually feeding a paper sheet to said transferring means;

manually-fed paper detecting means for detecting the paper sheet fed from said manual paper feeding means; and

control means for making a copying operation start in response to the operation of said manually-fed paper detecting means and for confirming the operation of said manually-fed paper detecting means after a predetermined period of time from the start of the copying operation, said control means including means for continuing the copying operation in response to the confirmation of the operation of said manually-fed paper detecting means and for restoring the copy operation to a standby state in response to the absence of confirmation of the operation of said manually-fed paper detecting means.

4,549,806

METHOD AND APPARATUS MEASURING ABSOLUTE ROTATION

Peter Marten, Blaustein-Dietingen, and Klaus Petermann, Ulm, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

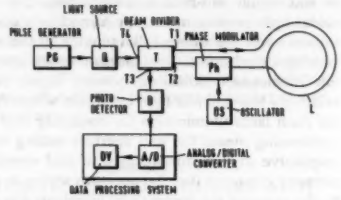
Filed Sep. 30, 1982, Ser. No. 432,375

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1981, 3140110

Int. Cl.[4] G01B *9/02*; G01C *19/64*

U.S. Cl. 356—350 **18 Claims**

1. In a method for measuring absolute rotation with the aid of a light conductive fiber ring interferometer including a light source for producing a light beam, a light beam dividing arrangement, a light path connected to the beam dividing arrangement and formed by a light conductive fiber coil, an optical phase modulator disposed in the light path, and a photodetector; said method including dividing the light beam produced by the light source into two light beam signals by means of the beam dividing arrangement, feeding the two light beam signals to the respective ends of the light path to circulate the two light beam signals through the light path in opposite directions, phase modulating the light signals circulating in the light path with a periodic optical phase modulation at a fundamental frequency f_O, combining the light signals exiting from the two respective ends of the light path to provide a combined optical output signal, and detecting the combined optical output signal, by means of the photodetector, to provide an electrical output signal; the improvement comprising: modulating one of the group consisting of said light beam, said two light beam signals and said output signals with a mixing frequency f_2 such that an electrical evaluation signal having an evaluation frequency f_1 which is less than said fundamental frequency f_O is produced on the output side of the photodetector; and evaluating said electrical evaluation signal to determine the absolute rotation.



4,549,807

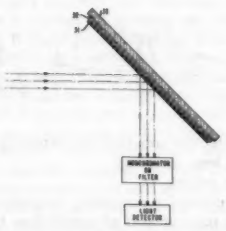
PROCESS FOR MEASURING FLUORESCENCE

Timothy D. Hoffmaster, Toms River, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 7, 1983, Ser. No. 539,793

Int. Cl.[4] G01N *21/64*

U.S. Cl. 356—318 **7 Claims**



1. A process for determining the presence of a fluorescing species in a condensed phase sample that interacts with an entity that quenches said fluorescence, said process comprising the steps of exciting said fluorescing species with electromagnetic radiation and monitoring the electromagnetic radiation emanating from said sample wherein said species in said sample is allowed to interact with a Raman enhancing surface during said determination.

4,549,808

MOVABLE APERTURE PHOTOELECTRIC MEASURING INSTRUMENT

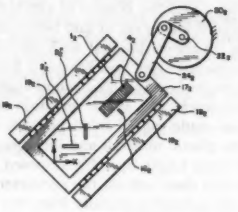
Alfons Ernst, Traunreut, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed May 2, 1983, Ser. No. 490,584

Claims priority, application Fed. Rep. of Germany, May 19, 1982, 3218903

Int. Cl.⁴ G01B *11/00, 11/26*

U.S. Cl. 356—374 **15 Claims**



1. In a photoelectric length measuring instrument for measuring changes in position of an object, said instrument comprising at least one aperture, and an optical system for projecting an image of the at least one aperture onto the object and a reflected image of the at least one aperture from the object back to the at least one aperture such that the position of the at least one aperture at which the reflected image of the at least one aperture coincides with the at least one aperture is a direct measure of the position of the object, the improvement comprising:

means for defining first and second apertures arranged perpendicularly to one another and included in the at least one aperture;

means for defining at least one measuring graduation mounted to the first and second apertures to move with the first and second apertures; and

a scanning unit mounted to scan the at least one measuring graduation to measure the position of the graduation and thereby of the first and second apertures in two directions positioned orthogonally with respect to one another.

4,549,809

METHOD FOR PHOTOMETRIC MEASUREMENT OF LIGHT ABSORPTION OF LIQUID SAMPLES IN CUVETTES

Tomiharu Minekane; Noboru Yokotani, both of Otawara, and Takehiko Onuma, Kurobane, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Sep. 28, 1983, Ser. No. 536,790

Claims priority, application Japan, Sep. 30, 1982, 57-171893

Int. Cl.⁴ G01N *21/00*

U.S. Cl. 356—436 **5 Claims**

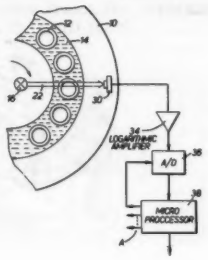
1. A method of photometric measurement of the light absorption of the contents of a cuvette moving at a predetermined rate through the path of a beam of light directed onto a light detector comprising the steps of:

a. fixing the time intervals between readings of the measurements of the light absorption as a function of the width of the cuvette, the predetermined rate of movement of the cuvette through the light path, and the required number of readings;

b. making an initial reading of the light absorptions in the light path immediately before the cuvette enters the light path;

c. comparing the differences between successive readings and the initial reading until the difference exceeds a predetermined limit less than the peak value of the readings of the leading wall of the cuvette, indicating passage of the leading wall and the arrival of a predetermined portion of the cuvette;

d. continuing readings until the desired number of readings is taken indicating the passage of the trailing wall of the cuvette; and



e. selecting a measurement of light absorption at exactly the same attained position as to each cuvette, as the predetermined portion of the cuvette passes through the path of the light beam.

4,549,810

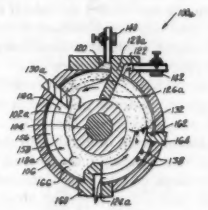
PHASE SEPARATING ROTARY PROCESSOR AND METHOD

Pradip S. Mehta, Corpus Christi, Tex., assignor to USM Corporation, Farmington, Conn.

Filed Dec. 20, 1984, Ser. No. 685,057

Int. Cl.⁴ B01F *7/10*

U.S. Cl. 366—75 **27 Claims**



1. Apparatus for separating out at least one phase of a material comprising a heterogeneous mixture of immiscible liquids of differing viscosities comprising:

(a) at least one stationary surface;

(b) at least one surface adapted for movement in a downstream direction relative to the stationary surface and forming therewith at least one enclosed processing passage in which viscous-drag-induced momentum is transferred from the moving surface(s) preferentially to the more viscous phase of the material in the passage, causing the more viscous phase to be moved downstream relative to the less viscous phase;

(c) a drainage opening for the passage; and

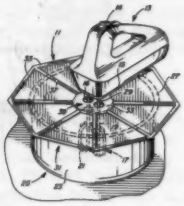
(d) an obstructing member for each passage disposed downstream of and a predetermined distance from the drainage opening and arranged to at least partially block the downstream movement of the material through the passage and to collect the material as a recirculating pool so that pressurization of the material and separation of at least some of the less viscous phase from the material can occur, the separated less viscous phase being discharged from the passage through the drainage opening.

4,549,811

MIXING BOWL SPLATTER GUARD

Robert E. Schiffner, and Susan R. Montgomery, both of 11900 N. 92nd Pl., Scottsdale, Ariz. 85260

Filed May 26, 1983, Ser. No. 498,566
Int. Cl.[4] B01F *7/32, 15/00*
U.S. Cl. 366—129 **1 Claim**



1. A bowl cover splatter shield for use with a hand-held portable electric mixer having a pair of drive sockets and a pair of beaters for mixing ingredients in a mixing bowl having a rim, each beater including a beater shaft, beater blades integral with one end of said shaft and a socket-engaging end at the opposite end thereof for removably engaging one of said drive sockets, each of said shafts including a circular collar operably disposed between said shaft ends substantially proximate to said socket-engaging end, said blow cover splatter shield comprising:

a relatively thin octagon-shaped sheet of relatively soft and resilient polypropylene plastic material having eight equal sides and a flat bottom adapted to be evenly disposed on top of the rim of said mixing bowl in order to allow said sheet to operably slide on top of said rim, the diameter of said sheet being larger than that of said mixing bowl, said flat bottom being adapted to contact said beater blades when said beater blades are raised during cleaning operations within said bowl without chipping or breaking said splatter shield while simultaneously increasing cleanability and ease of material removal;

a raised central island of relatively soft and resilient polypropylene plastic material disposed in the approximate center of said octagon-shaped sheet for reinforcing same, said central island being integral with the top of said sheet and having a raised octagon shape with eight equal sides, said octagon shape of said raised central island being concentric with said octagon-shaped sheet and the sides of said octagon shape of said raised central island being parallel to the corresponding sides of said octagon-shaped sheet;

said raised central island having a pair of generally circular apertures spaced apart a distance approximately equal to the distance between each of said drive sockets for (a) removably passing the socket-engaging ends of said beater shafts from the flat bottom through the top of said sheet for insertion into the mixer drive sockets, (b) removably passing said circular collars through said sheet in order to prevent any of the material being mixed in said mixing bowl from splattering into said drive sockets, (c) providing increased freedom of motion of the beater shaft in order to provide increased freedom of movement of said beater blades for more thorough mixing throughout said mixing bowl, and (d) allowing said octagon-shaped sheet to be used as a stand for said mixer during periods of non-use, said apertures being operably disposed with respect to the sides of said octagon-shaped sheet in order to allow said sheet to be used for the purpose of standing up said mixer, said apertures being oriented with respect to the sides of said octagon-shaped sheet so that a line lying on the plane of said octagon-shaped sheet and passing through both centers of said apertures is both perpendicular to a first pair of the sides of said octagon-shaped sheet and parallel to a second pair of the sides of said octagon-shaped sheet, said mixer being operably positioned with respect to said octagon-shaped sheet in order to use said sheet for standing up said mixer by moving said beater shafts through said apertures a sufficient distance to allow said sheet to be rotated so that one end of said mixer will rest on a horizontal surface, the other end of said mixer will rest against said sheet and one side of said sheet will rest on said horizontal surface such that said mixer remains in a standing position and said sheet makes an angle of approximately forty-five degrees with said horizontal surface for preventing splattered mixer material from rapidly running off of the flat bottom of said sheet and for allowing said flat bottom to catch the splattered mixing material dripping off of said beater blades; and

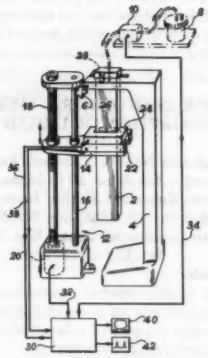
shape retention rib means integral with the top surface of said octagon-shaped sheet and having a height approximately equal to the height of said raised central island for added reinforcement and shape retention of said sheet, said rib means made out of relatively soft and resilient polypropylene plastic material and including eight elongated ribs of equal length operably disposed from vertice to vertice of said sheet around the perimeter thereof and eight radial ribs extending radially from the perimeter of said sheet to said raised central island, each of said eight radial ribs being of equal length and extending from a vertice at said perimeter of said octagon-shaped sheet to a corresponding vertice at the perimeter of said octagon shape of said raised central island, said elongated ribs and said radial ribs together with said raised central island structurally form eight identical four-sided polygons connectively adjacent each other and surrounding the periphery of said raised octagon-shaped island.

4,549,812

LIQUID PHASE COUNTER

Pierre Bothorel, Pessac; Roland Bernon, Cestas, and Guy Gabriel, Pessac, all of France, assignors to Centre National de la Recherche Scientifique, Paris, France

Filed Oct. 24, 1984, Ser. No. 664,432
Claims priority, application France, Oct. 25, 1983, 83 16973
Int. Cl.[4] B01F *13/08*
U.S. Cl. 366—142 **6 Claims**



1. A liquid phase counter for a partly liquid and transparent mixture, wherein it comprises:

at least one cell fixed to a support, each cell being arranged vertically and containing a partly liquid and transparent mixture,

a means for homogenizing the mixture of each cell,

an optical means for measuring the optical transparency of the mixture between two walls of a cell,

a displacement means for displacing the homogenization means and the measuring means over the entire height of

a cell and a parallel thereto, as well as a positioning means for positioning said means to the right of each cell,

an electronic control and processing means supplying signals for controlling the displacement and positioning means and the homogenization means and able to determine the number of phases of a mixture according to the signals received from the optical measuring means.

4,549,813

APPARATUS FOR MIXING A SOLUTION

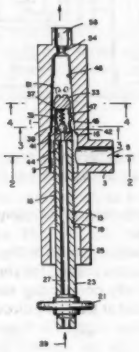
Hartwig Volz, Celle, and Egon Willmann, Hamburg, both of Fed. Rep. of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 325,612, Nov. 27, 1981, abandoned. This application Jun. 26, 1984, Ser. No. 624,544

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1980, 3045383

Int. Cl.[4] F16K *19/00*

U.S. Cl. 366—160 **6 Claims**



1. Apparatus for forming at least two liquids into a substantially uniform mixture for delivery thereof through a discharge opening, which apparatus includes;

an elongated body (1), means forming a longitudinal bore (19) in said body and including a cylindrical wall portion having at least one inlet (5) communicated with a source of a first liquid, and an inwardly convergent wall section downstream of the cylindrical wall portion,

an elongated plunger (13), operably positioned in said longitudinal bore (19), being threadably rotatable in said bore (19) to adjust the longitudinal relationship of said plunger (13) with respect to said inwardly convergent wall section, said elongated plunger having an axial passage (27) communicated with a source of a second liquid, and being spaced from said cylindrical wall portion to define an annular metering chamber (9), thereby to form an annular stream of said first liquid,

a metering head (33) on said elongated plunger (13), disposed contiguous with the inwardly convergent wall section of said bore (19) to form a convergent wall mixing compartment (45), which is adjustable in cross-section in response to longitudinal movement of said plunger (13) through said bore (19), and a turbulence chamber (46), downstream of said mixing compartment,

said metering head (33) including an inner distribution compartment (35) communicated with said axial passage (27), and a plurality of discharge ports (47) therein communicating said distribution compartment (35) with mixing chamber (45) to introduce radial streams of said second liquid into said annular stream of said first liquid,

and means in said elongated body (1) forming a discharge opening (54) in said turbulence chamber (46) to conduct the mixture of said at least two liquids therefrom.

4,549,814

TEST PLATE HAVING A THERMAL TEST PATTERN

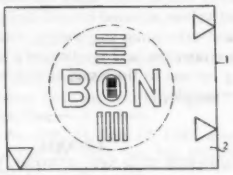
Georges N. Creel, Saint Arnoult, and Claude Morelle, Chatenay-Malabry, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 1, 1983, Ser. No. 556,756

Claims priority, application France, Dec. 17, 1982, 82 21188

Int. Cl.[4] G01D *18/00*

U.S. Cl. 374—2 **7 Claims**



1. A thermal test plate for use with a collimator comprising:

a flat dielectric substrate having front and rear faces and a thermal emissivity;

a number of test pattern motifs on the front face of the substrate, said motifs comprising a material having a thermal emissivity greater than that of the substrate;

a flat layer of a highly electrically resistive material on the rear face of the substrate; and

two electrically conductive strips on the rear face of the substrate, said strips connected to opposite sides of the resistive layer for conducting an electric current to the resistive layer material.

4,549,815

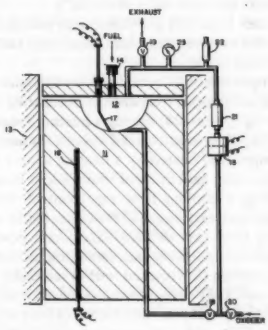
MEASUREMENT OF IGNITION CHARACTERISTICS OF DISTILLATE FUELS

Chaya Venkat, Bellemead, N.J., and Dennis E. Walsh, Richboro, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 21, 1983, Ser. No. 554,014

Int. Cl.[4] G01N *25/54*

U.S. Cl. 374—8 **8 Claims**



1. Apparatus for measuring the ignition delay of distillate fuel comprising:

a block having an ignition cavity;

means for heating said block to an elevated temperature above the ignition temperature of said fuel so that the temperature in said cavity is substantially uniformly the same temperature as said block;

means for injecting samples of said fuel into said ignition cavity as said block cools from said elevated temperature;

means for measuring the pressure in said cavity;

means for measuring the temperature in said cavity;

a digital computer having:

means for controlling the time of injection of said samples;

said pressure and temperature measuring means being connected to said digital computer:

means in said digital computer for measuring ignition delay as the time between the injection of a sample and ignition as indicated by a peak in measured cavity pressure or temperature;

means for recording said ignition delay as a function of the cavity temperature when ignition occurred; and

solenoid valves actuated by said digital computer for flushing and exhausting said cavity, said valves being closed during injection and ignition of a sample and thereafter being opened to flush said cavity before injection of another sample.

4,549,816

APPARATUS FOR MEASURING MELTING AND BOILING POINTS OF GAS

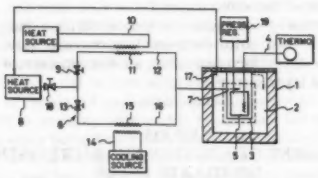
Koji Fujioka, Sapporo, Japan, assignor to Hoxan Corporation, Sapporo, Japan

Filed Sep. 12, 1983, Ser. No. 531,262

Claims priority, application Japan, Oct. 13, 1982, 57-154879[U]; Mar. 30, 1983, 58-46149[U]

Int. Cl.[4] G01N *25/02*

U.S. Cl. 374—27 **3 Claims**



1. An apparatus for measuring the melting point and the boiling point of gas, comprising:

(a) a heat insulating tank (**21**) with an inner wall (**21'**) also a heat medium passage (**26**) between said heat insulating tank (**21**) and said inner wall (**21'**);

(b) an inner tank (**25**) provided with said heat medium passage (**26**) between said heat insulating tank (**21**) and said inner wall (**21'**);

(c) a sample cell (**29**) contained within said inner tank (**25**) with a sample gas temperature measuring system (**30**);

(d) a piping system (**34**) having a heating route (**37**) including a heating flow rate control valve (**35**) and a heating heat exchanger (**36**) heated by a heating source (**32**) connected in series with said control valve and a cooling route (**40**) including a cooling flow rate control valve (**38**) also a cooling heat exchanger (**39**) connected in series with said cooling flow rate control valve, said components being connected in parallel, and, including an outlet (**52**) of said piping system (**34**) opened within said inner tank (**25**), said inner tank (**25**) being communicated with said heat medium passage (**26**) and the output (**31**) of said heat medium passage (**26**); said apparatus being characterized in that

(e) the heating of said heat exchanger (**36**) is also accomplished by means of a heating part (**41**) connected in series with a Joule-Thomson expansion valve (**42**), and there is a cooling part (**43**) for cooling said cooling heat exchanger (**39**) connected with a compressor (**44**) for compressing and supplying a refrigerant, whereby, a sample gas supplied from a gas source is introduced into a sample cell (**25**) of said heat insulating tank (**21**), said sample gas being then heated or cooled in the cell by means of a heating heat exchanger (**36**) or a cooling heat exchanger (**39**), when the transition melting and/or boiling points of the sample gas are reached, the temperature is indicated by a thermometer connected to the sample gas measuring system.

4,549,817

THERMAL MONITORING APPARATUS FOR TRANSFORMERS OR CHOKES

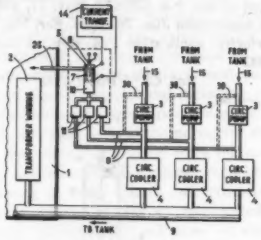
Willibald Felber, Weiz, Austria, assignor to Elin Union AG, Vienna, Austria

Filed Nov. 14, 1983, Ser. No. 551,601

Claims priority, application Austria, Nov. 15, 1982, 4142/82

Int. Cl.[4] G01K *1/12*

U.S. Cl. 374—152 **12 Claims**



1. An apparatus for thermal monitoring of an electrical component, such as a transformer winding or choke coil, comprising:

a tank for housing the electrical component and containing a cooling medium;

at least one circulation pump for the cooling medium;

at least one circulation cooler for the cooling medium;

means for operatively connecting said at least one circulation pump and said at least one circulation cooler with said tank and forming a circuit for forced cooling of said electrical component by the cooling medium;

a container operatively associated with said tank and supplied with said cooling medium;

a thermosensor;

a thermosensor winding surrounding said thermosensor;

said thermosensor and said thermosensor winding being arranged within said container;

a current transformer operatively connected to said thermosensor winder and supplying the same with a current which is essentially proportional to current flowing through said electrical component during operation of said electrical component;

means for branching-off part of the cooling medium flowing through said at least one circulation pump and said at least one circulation cooler and for infeeding said branched-off cooling medium to said container; and

said branching-off means being operatively associated with said at least one circulation pump and being arranged upstream of said at least one circulation cooler with respect to a predetermined direction of flow of cooling medium through said forced cooling circuit.

4,549,818

TEMPERATURE DETECTOR

Yasuhiko Nishikubo; Toyoharu Fujikawa, and Tsutomu Tanaka, all of Tokorozawa, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Dec. 2, 1983, Ser. No. 557,469

Claims priority, application Japan, Dec. 10, 1982, 57-217417

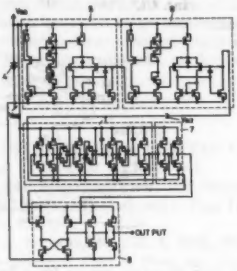
Int. Cl.[4] G01K *7/00*

U.S. Cl. 374—178 **3 Claims**

1. A temperature detector made by a CMOS integrated circuit, comprising:

first constant voltage circuit means for producing a first constant voltage;

second constant voltage circuit means, connected to said first constant voltage circuit means, applied in series with said first constant voltage for producing a second constant voltage; and



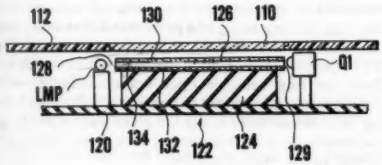
ring oscillator means, connected to said first constant voltage circuit means, applied in series with said second constant voltage for producing an output voltage dependent on ambient temperature.

4,549,819

ELECTRONIC CLINICAL THERMOMETER

Yutaka Muramoto, and Taketoshi Ikegami, both of Fujinomiya, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 465,343, Feb. 9, 1983, abandoned. This application Jun. 10, 1985, Ser. No. 742,655
Claims priority, application Japan, Feb. 19, 1982, 57-25770
Int. Cl.[4] G01K *7/00*
U.S. Cl. 374—178 **6 Claims**



1. An electronic clinical thermometer of the type having temperature measuring means for measuring the temperature of the human body and for producing an output signal indicative of the measured value, display means for presenting a visual display of the measured value, and an envelope for accommodating the temperature measuring means and the display means, said electronic clinical thermometer comprising:

said display means including liquid crystal display elements which are visually recognizable only when a certain level of light is incident on said display elements;

said liquid crystal elements of said display means being sandwiched between glass-like bodies so as to propagate a fraction of the ambient light incident on the liquid crystal display elements with repeated reflection through the interior of said display means to emerge at an edge thereof;

photosensing means disposed along an edge of the liquid crystal display element where the propagated light emerges for sensing ambient light propagated between said glass-like bodies;

illuminating means provided along another edge of the liquid crystal display elements to illuminate the liquid crystal display elements; and

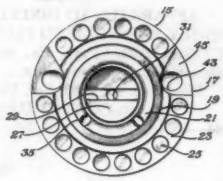
a control circuit provided in said envelope and connected to said temperature measuring means, said illuminating means and said photosensing means, for placing said photosensing means in an operative state when said temperature measuring means completes a temperature measurement, and for automatically activating said illuminating means to illuminate said display means for visual recognition of the measured value on said display elements responsive to said photosensing means, in its said operative state, sensing a level of ambient light below said certain level.

4,549,820

OPPOSED BUTTON THRUST SURFACES FOR EARTH BORING BITS

John M. Mullins, Houston, Tex., assignor to Hughes Tool Company - USA, Houston, Tex.

Continuation of Ser. No. 389,781, Jun. 18, 1982, abandoned. This application Feb. 13, 1984, Ser. No. 578,318
Int. Cl.[4] F16C *17/04*
U.S. Cl. 384—95 **2 Claims**



1. In an earth boring bit having a body with a depending bearing pin having a cylindrical outer section and a cylindrical inner section of lesser diameter, defining a bearing pin shoulder at the function of the inner and outer sections, the bit having a cutter with a cavity containing a cutter shoulder positioned opposite the bearing pin shoulder, the improvement comprising:

a plurality of cylindrical wear resistant buttons interferingly pressed in a circular array into holes formed in each of the shoulders, the buttons in the cutter shoulder having flat ends that slidingly engage flat ends of the buttons in the bearing pin shoulder, the buttons in one of the shoulders being formed of tool steel and being longer than the holes in which they are secured, causing them to protrude from the shoulder within which they are secured;

the buttons in the opposite shoulder being formed of tungsten carbide and having ends which are substantially flush with the shoulder in which they are secured.

4,549,821

FOIL BEARING

Toshiro Kawakami, Ohbu, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 16, 1983, Ser. No. 552,469
Claims priority, application Japan, Nov. 17, 1982, 57-201762; Nov. 17, 1982, 57-201763
Int. Cl.[4] F16C *32/06*
U.S. Cl. 384—103 **3 Claims**

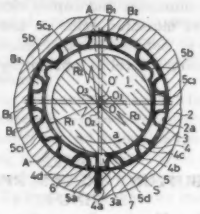
1. A foil bearing, comprising:

a bearing housing provided with an axial hole therein;

a damp foil supported in said bearing housing at an inner periphery thereof; and

a top foil supported in said bearing housing at an inner periphery of said damp foil, wherein said top foil is made of a single sheet of metal and further comprises at least three arc portions connected to one another through at least two connecting portions so as to have a nearly circular shape in section, each of said arc portions having a larger

radius of curvature than the length between the center of said top foil and any point on said arc portions, and each



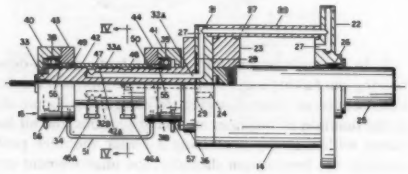
of said connecting portions is of a shape so as to project in a centrifugal direction.

4,549,822

APPARATUS TO DISTRIBUTE A HIGHLY-PRESSURIZED FLUID MEDIUM

Charles A. Crates, Bethel Park, Pa., assignor to SMS Schloemann-Siemag, Inc., Pittsburgh, Pa.

Filed Aug. 15, 1983, Ser. No. 523,019
Int. Cl.[4] F01B *31/00*
U.S. Cl. 384—462 **7 Claims**



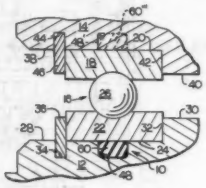
1. A distributor for a highly-pressurized fluid medium at pressures of up to 1500 psi including the combination of a drum-like rotor having separate longitudinal bores extending from one end along part of the length thereof, each longitudinal bore intersecting with one of longitudinally-spaced radial rotor bores for conducting a fluid medium, a stator defining a stator bore, said stator having a hardened face surface, means including spaced-apart and radially-extending portal openings communicating with said stator bore for conducting a fluid medium, bearing means supported by the stator at opposite ends of said stator bore for rotatably carrying said rotor so that the radial bores of the rotor move into a generally confronting relation with said portal openings for transferring fluid medium therebetween, said rotor having a hardened rotor face surface forming an annular orifice with the hardened face surface of said stator bore, and drain means for conducting the fluid medium from the annular orifice, said drain means including an annular drain reservoir at each of opposite ends of said annular orifice outwardly of said radial bores between said radial bores and said bearing means, each annular drain reservoir being closely spaced from an adjacent one of said radial bores such that the portion of said annular orifice extending between said radial bores is of sufficient length to substantially prevent the flow of said fluid medium therealong between said radial bores as compared with the lengths of portions of the annular orifices extending between each radial bore and an adjacent annular drain reservoir for continually delivering fluid medium to said drain means, said stator and rotor defining annular metering orifices between each of said bearing means and an adjacent one of said annular drain reservoirs for supplying a fluid medium to said bearing means for lubrication thereof.

4,549,823

BEARING RACE RETENTION DEVICE AND METHOD

Robert P. Nichting, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 29, 1984, Ser. No. 614,498
Int. Cl.[4] F16C *35/07*
U.S. Cl. 384—537 **7 Claims**



1. A bearing race retention device for a bearing assembly mounted between a first member and a second member having a cylindrical surface, comprising:

the bearing assembly having a first race secured to the first member, a plurality of bearing elements, and a second race defining a smooth notchless cylindrical surface and a preselected diametral slip fit clearance with the cylindrical surface of the second member;

a swellable ring of unrestrained uniform circular cross section about its periphery and being of a preselected diameter; and

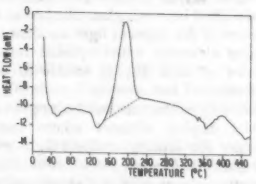
an annular groove of generally rectangular cross section concentrically formed in the second member and defined generally by a cylindrical seat and first and second side walls spaced apart about 1½ times the preselected diameter for containment purposes, the swellable ring being disposed in the groove and being compressed radially during installation of the second race and into a mean groove fill condition of at least 65% in volume prior to swelling of the ring, the ring being of a preselected thermoset elatomeric material sufficient for volumetrically swelling upon the exposure thereof to a petroleum-based lubricating fluid, the ring being in open communication with the clearance and in response to being exposed to the lubricating fluid substantially filling the groove upon swelling and frictionally holding the second race from rotating with respect to the second member.

4,549,824

INK ADDITIVES FOR EFFICIENT THERMAL INK TRANSFER PRINTING PROCESSES

Krishna G. Sachdev, Wappingers Falls, and Ari Aviram, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1983, Ser. No. 567,211
Int. Cl.[4] B41J *3/16, 31/02;* C09D *11/02;* G01D *15/10*
U.S. Cl. 400—241.1 **50 Claims**



1. In thermal transfer printing an ink bearing ribbon comprising a support layer and at least one other layer, said one other layer including a fusible ink which is solid and stable at room temperature and which comprises an aromatic azido com-

pound which is stable at room temperature but which exotherms at the conditions of the thermal transfer printing.

2. In a thermal transfer printing process wherein energy is applied to an ink-bearing ribbon to melt and transfer ink from said ink-bearing ribbon to a receiving medium for printing thereon, the improvement wherein some of the heat required for said printing is provided by an exothermic chemical reaction of an aromatic azido compound which is stable at room temperature but which exotherms at the conditions of the thermal transfer printing.

4,549,825

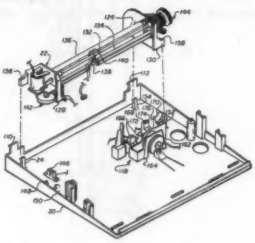
THERMAL PRINTER FOR A LOW COST ELECTRONIC MAIL TERMINAL

Russell Fish, III, Mountain View, and James R. Yurchenco, Palo Alto, both of Calif., assignors to Post Technologies, Inc., Menlo Park, Calif.

Division of Ser. No. 465,040, Feb. 8, 1983, Pat. No. 4,524,242. This application Jul. 23, 1984, Ser. No. 633,609

Int. Cl.[4] B41J *29/02*

U.S. Cl. 400—692 **20 Claims**



1. A printer for printing characters onto thermally sensitive paper, said printer comprising:

means forming a base having a planar surface;

a first plate coupled to said base and disposed substantially perpendicular to said surface of said base;

a second plate coupled to said base and disposed laterally spaced apart from and approximately parallel to said first plate;

a first shaft disposed between and rotatably coupled to said first and second plates, said first shaft being disposed approximately parallel to said surface of said base and carrying at least one paper engaging roller;

a second shaft disposed between and coupled to said first and second plates and disposed parallel to said first shaft;

means forming a platen disposed between and coupled to said first and second plates and disposed parallel to said shafts;

means forming a passageway between said platen and said first and second shafts for receiving a continuous web of paper;

a carriage slideably coupled to said first and second shafts;

print head means removeably coupled to said carriage and operable for locally heating said paper to transfer a character pattern thereto;

carriage positioning means coupled to said plates and to said carriage for laterally positioning said carriage along said shafts, said carriage positioning means including;

a first pulley coupled to said first plate and rotatable about an axis perpendicular to said shafts, said first pulley having an upper portion and a lower portion;

a second pulley coupled to said second plate and rotatable about an axis parallel to said axis of said first pulley, said second pulley being coupled to said second plate by a dowel pin disposed at the axis of said second pulley, said dowel pin being retained in a groove in said second plate by said second shaft;

belt means for translating said carriage in response to rotation of said first pulley, said belt means forming a loop around said upper portion of said first pulley and said second pulley with both ends thereof being affixed to said carriage; and

belt drive means coupled to said lower portion of said first pulley for rotating said first pulley.

4,549,826

PAPER FEED APPARATUS FOR TYPEWRITERS OR BUSINESS MACHINES HAVING A PAPER LEVELLING GAP DISPOSED IN THE PAPER GUIDANCE CHANNEL

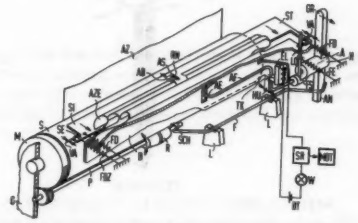
Walter Stoeberl, Holzkirchen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 16, 1984, Ser. No. 610,866

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1983, 3319961

Int. Cl.[4] B41J *11/64*

U.S. Cl. 400—708 **9 Claims**



1. A paper feed apparatus for the transport of continuous roll paper in a printer having a motor-driven platen and a paper guidance channel partially encircling said platen comprising:

a stationary plate-like member and an opposed movable plate-like member from each other spaced to form a paper leveling gap therebetween, positioned in the ingress region of said paper guidance channel upstream of said platen, at least one of said members contacting said paper along its entire width to smooth out the paper being supplied to the platen through the paper guidance channel,

said members extending at least over the width of said paper being transported,

said gap having a minimum width present as a function of the thickness of said paper,

said movable member being capable of movement away from said stationary member against a spring member to increase the width of said gap in response to deformed paper,

a sensing means for detecting movement of said movable member further away from said stationary member than said minimum preset width of said gap,

whereby said sensing means interrupts the transport of said paper upon the movement of said movable member beyond a predetermined position.

4,549,827

WRITING IMPLEMENT WITH TWO RETRACTABLE CARTRIDGES

Wolfgang Mack, Tannenweg 4, D-6492 Sinntal-Sannerz, Fed. Rep. of Germany

Filed Jan. 17, 1984, Ser. No. 571,474

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1983, 8301410[U]

Int. Cl.[4] B43K *27/12, 24/02*

U.S. Cl. 401—29 **12 Claims**

1. Writing implement comprising: two writing cartridges, each of said cartridges having a spring and a housing enclosing the cartridge and spring; a writing point in each cartridge at

one end of the cartridge; said cartridges being spring-loaded by the springs; connecting means for connecting the housings, said connecting means comprising a pivot for relative pivoting of the two housings; a cartridge displacement cam on each housing at a pivot end of the housing remote from the writing point, said cam for displacing lengthwise the other cartridge; the cams being so shaped that the writing points project out of the housings when the housings are substantially opened out and the housings are rotated about said pivot at a substantial

angle relative to each other, said writing points being retracted into said housings when said angle is substantially reduced; said two housings and said connecting means forming a clamp having a closed position in which said angle is substantially zero and said housings are together in contact in substantially parallel relationship, said writing points being fully retracted in said closed position, said clamp being clampingly attachable to an edge of a garment worn by a user, said writing points being projected out of said housings by said cams when said clamp is in open position and said angle is substantially an obtuse angle.

4,549,828

WRITING INSTRUMENT WITH SEPARABLE COMPENSATING MEANS

Gerold Anderka, Ellerbek, and Rolf Tenhagen, Henstedt-Ulzburg, both of Fed. Rep. of Germany, assignors to Rotring-Werke Riepe KG, Hamburg, Fed. Rep. of Germany

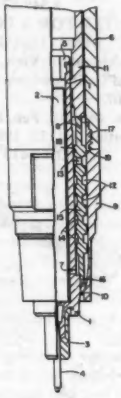
Filed Nov. 21, 1983, Ser. No. 554,141

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1982, 3244697

Int. Cl.[4] **B43K** *5/16, 1/06, 1/10*

U.S. Cl. 401—258 **3 Claims**

1. In a tubular writing instrument of the type comprising a writing fluid tank (11) capable of being pushed from behind onto an outer surface of a cylindrical body, (1) having an inner bore communicating between said tank and a writing tubule carried at the forward end of said cylindrical body (1), an ink compensating means in sealing engagement about said cylindrical body which further comprises an inner ink compensating chamber, which is defined between a smooth outer surface of said cylindrical body and passages formed within an inner surface of a wall element (15), said inner ink compensating chamber having a forward end that communicates to said inner bore through a transverse bore (7) in said cylindrical body, wherein said ink compensating means further comprises an outer ink compensating chamber, which is defined between passages formed within an outer surface of said wall element and a smooth inner surface of a sheath element, wherein further the forward end of the outer ink compensating chamber communicates to ambient air through an opening defined between said cylindrical body outer surface and said sheath element and, further, the rearward end of said inner ink compensating chamber communicates with said outer ink compensating chamber via a connecting bore through said wall element, the improvement which comprises a wall element which comprises a sheath body (15) which is adapted to be pushed from the rear onto the outer surface of said cylindrical body (1) and is separate from said writing fluid tank, said sheath body having a forward end adapted to abut against a forward surface of said cylindrical body and having a rearward end in sealing engagement between said cylindrical body (1) and said sheath element (9) at a point proximate and rearward to said connecting bore, said sheath body (15) being made of a plastic having



an elastic deformability which is greater than that of a plastic comprising either the cylindrical body (1) or the sheath element (9) wherein, further, said sheath element has a rearward end which is removably engaged to a holder shaft forward end which is rearward of said point of sealing engagement, whereby said sheath element (9) is removable, from said holder shaft towards the front of said writing instrument, thereby to expose the outer surface of said sheath body (15) and thereafter enable said sheath body to be removed rearwardly from said cylindrical body by grabbing about the holder shaft and proximate the cylindrical body forward end, and axially separating the writing instrument.

4,549,829

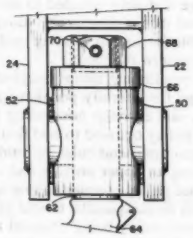
TRUNNION FOR HOOK AND BLOCK ASSEMBLY

Richard E. Springer, Tulsa, and Gary R. Baxter, Owasso, both of Okla., assignors to The Crosby Group, Inc., Tulsa, Okla.

Filed Sep. 24, 1982, Ser. No. 422,604

Int. Cl.[4] **F16D** *3/16*

U.S. Cl. 403—57 **9 Claims**



1. A trunnion assembly for interconnecting a hook shank and block comprising:

a pair of spaced block side plates, each having an outside and

an inside surface, axially aligned openings in each of said side plates;

a trunnion body having a first bore therethrough to receive said shank of said hook, a second bore in said trunnion body transverse to said first bore to receive trunnion pins, means to maintain said trunnion pins non-rotatably positioned to said trunnion body on each side of said shank, each of said trunnion pins of length to extend from the periphery of said first bore into said aligned opening in each of said side plates, said trunnion pins rotatable relative to said side plates; and

means to rotatably retain said shank of said hook in said first bore of said trunnion body.

4,549,830

FASTENING OF A SEALING BELLOWS TO THE JOINT HOUSING OF A BALL JOINT

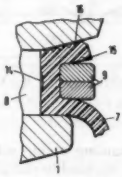
Ulrich Mette, Essen, Fed. Rep. of Germany, assignor to TRW Ehrenreich GmbH & Co. KG, Dusseldorf, Fed. Rep. of Germany

Filed Nov. 2, 1984, Ser. No. 667,880

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1983, 3341993

Int. Cl.⁴ F16C *11/06*

U.S. Cl. 403—134 **2 Claims**



1. Apparatus for fastening a sealing bellows to a joint housing of a ball joint, in which the housing-side rim of the sealing bellows is set firmly into a substantially U-shaped ring groove circumscribing the joint housing, wherein the bellows rim has a profiling adapted to the U shape of the ring groove and is clamped into the ring groove by a clamp ring, characterized in that the profiled zone of the bellows rim lying opposite the bottom of the ring groove forms, in the groove, a circumferential fold spacedfrom the bottom of the groove and arched outwardly and which stretches under the radial pressure of the clamp ring.

4,549,831

SET OF JOINING HARDWARE

Karl Lautenschläger, Jr., Reinheim, Fed. Rep. of Germany, assignor to Karl Lautenschlager KG Mobelbeschlagfabrik, Reinheim, Fed. Rep. of Germany

Filed Oct. 26, 1983, Ser. No. 545,631

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1982, 3240335; Jun. 18, 1983, 3321976

Int. Cl.⁴ B25G *3/00*

U.S. Cl. 403—231 **25 Claims**

1. A set of hardware for rigidly, releasably joining one wall of a cabinet to another wall of the cabinet arranged substantially at right angles to the one wall in a plane; said set having:

(a) a first component having means for fastening said first component to the one wall;

(b) a second component for fastening to the other wall; and

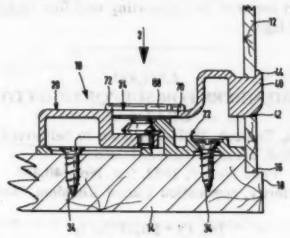
(c) tightening means for bringing said two components into interlocking engagement with one another and for clamping the same together to thereby pull the one wall against the other wall;

said second component having a surface for placement against the other wall and having a first engaging surface projecting from said placement surface;

said first component being an elongated housing open toward and at least partly over-reaching said second component, upon interlocking engagement of said components;

said tightening means:

(a) being rotatable about a first axis at right angles to said placement surface and substantially parallel to said plane; and



(b) having a first disk with a second axis of rotation arranged at a given eccentricity with respect to said first axis and with a curved circumferential surface forming a second engaging surface for engagement with said first engaging surface.

4,549,832

SLIP-IN FASTENING ELEMENT FOR JOINING TOGETHER TWO PARTS SO THAT THEY MAY BE UNDONE

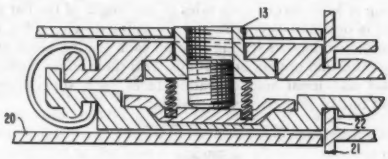
Rudolf Sterl, Wendelstein, Fed. Rep. of Germany, assignor to Hestex Systems b.v., Apeldoorn, Netherlands

Filed Nov. 18, 1982, Ser. No. 442,776

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1981, 8134536[U]

Int. Cl.⁴ F16B *7/04*

U.S. Cl. 403—264 **5 Claims**



1. In an expandable locking fastening element for joining together first and second structural members, said fastening element being of the type including first and second generally parallel legs having adjacent first and second ends, said two legs being joined together by hinge means so that they may be hinged about an axis which is at said first ends and which is generally normal to a direction of expansion of said fastening element for locking the same in position, a fixing screw for moving said legs apart and thus for causing such expansion, each said leg having at said second end thereof a hooked head adapted to be hooked onto a part of a lip at an edge of an opening in a first structural member to be joined, one of said legs having therein a sliding sleeve adapted to lock said fastening element in a desired position of adjustment along a hole in a second member to be joined and into which said fastening element is to be positioned, the improvement wherein:

said hinge means comprises a c-shaped spring ring having jaws fitting into grooves formed in said first ends of said legs;

said sliding sleeve comprises an internally threaded plug slidably extending through an opening in said first leg;

said second leg has a support member;

said fixing screw is threaded into said plug and has an inner end movable between a retracted position spaced from said support member, whereat said spring ring urges said legs toward each other, and an extended position abutting said support member, whereat said legs are forced apart against the action of said spring ring; and

one of said legs has extending from said first end thereof a support member for supporting said first end of the other of said legs.

4,549,833

FRAME MEMBERS FOR SUPPORTING COVERS OR GRATINGS

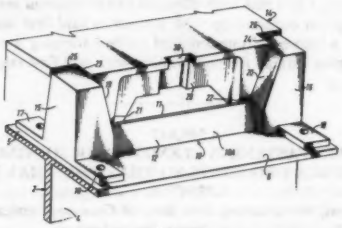
Derek Ferns, Trelleck, Wales, assignor to Selflevel Covers (Jersey) Limited, Jersey, Channel Islands

Filed Nov. 9, 1982, Ser. No. 440,435

Claims priority, application United Kingdom, Nov. 10, 1981, 8133879

Int. Cl.⁴ E02D *29/14*

U.S. Cl. 404—4 **7 Claims**



1. A frame member for supporting two adjacent covers or gratings, comprising two seating blocks, an elongate frame bar, joining the seating blocks, angled seating faces on the respective seating blocks and said faces being inclined downwardly towards each other, and additional angled seating faces extending along at least part of both sides of the length of the bar and inclined in opposite directions and diverging downwardly, the first-mentioned angled seating face on each seating block supporting both said covers or gratings with their edges contiguous, said additional angled seating faces each supporting a different one of said covers or gratings.

4,549,834

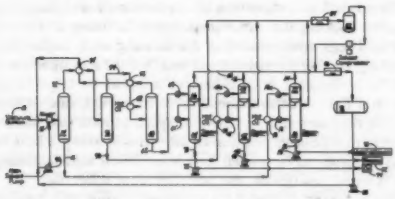
ASPHALT REJUVENATING COMPOSITION AND PROCESS

Jerry R. Allen, Des Moines, Iowa, assignor to Pester Refining Company, Des Moines, Iowa

Filed Sep. 29, 1983, Ser. No. 536,990

Int. Cl.⁴ E01C *7/18;* **C08L** *95/00*

U.S. Cl. 404—75 **14 Claims**



1. An asphaltic composition especially suitable for rejuvenating recycled asphalt-aggregate road compositions, consisting essentially of from about 30% by weight to about 50% by weight of asphaltic oils, from about 40% by weight to about 60% by weight of asphaltic resins, and from about 3% by weight to about 20% by weight of asphaltic pitch.

5. The method of improving road life of asphaltic roads which are made of substantial amounts of old, reclaimed road aggregate which includes the old worn asphalt, in combination with an asphalt binder, consisting essentially of:

employing as the asphaltic binder a high resin content asphalt, with a resin content within the range of from about 40% by weight to about 60% by weight of the asphalt binder component.

4,549,835

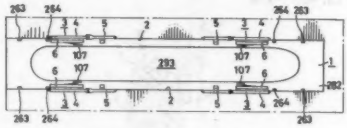
DOCKING APPARATUS FOR SHIPS

Takehiro Ando, Ibaraki; Shuji Miyake, Nara; Osamu Murakami, Honmachi; Takashi Kawabata, Osaka; Shigeo Hayashi, Habikino; Michiyasu Otonari, Osaka, and Toyoaki Kato, Yamato, all of Japan, assignors to Hitachi Zosen Corporation, Osaka, Japan

Filed Nov. 23, 1983, Ser. No. 554,501

Int. Cl.⁴ B63C *1/08*

U.S. Cl. 405—4 **9 Claims**



1. An apparatus for hauling a ship into and out of a dock comprising a drive truck adapted to run along a side wall of the dock approximately horizontally, a surface treating truck connected to the drive truck at all times and having a hull surface treating device, and a docking truck connectable to and separable from the drive truck and having a retractable hull suction disk, the drive truck alone being provided with running drive means.

4,549,836

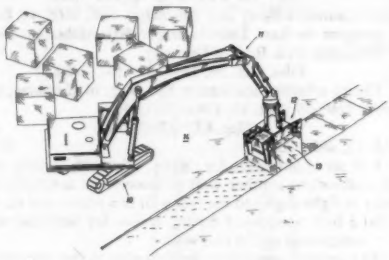
ICE SLOT CONSTRUCTION

Dean P. Hemphill, Houston, and Edward H. Phifer, Katy, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 2, 1983, Ser. No. 557,494

Int. Cl.⁴ E02B *15/02*

U.S. Cl. 405—61 **2 Claims**



1. A method for forming an ice slot in an ice sheet floating on water, comprising:

cutting discrete blocks of ice;

gripping the ice blocks with a claw-like attachment to a hydraulic arm held by means supported on the ice sheet; and

pushing the ice blocks downward and under the surrounding

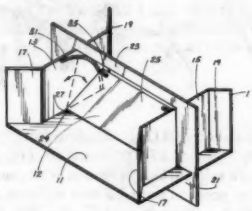
ice sheet, the claw-like attachment being utilized to rotate the ice blocks as the ice blocks are pushed under the surrounding ice sheet.

4,549,837

PENSTOCK

Camile J. Hebert, P.O. Box 27, Palmetto, La. 71358

Filed Jul. 21, 1983, Ser. No. 516,210
Int. Cl.[4] E02B *7/36, 7/40*
U.S. Cl. 405—101 **5 Claims**



1. An improved penstock for obtaining and maintaining a differential level of liquid between two adjacent bodies of the liquid separated by a levee, wherein said improved penstock comprises:

(a) a flow channel means within the wall of said levee allowing liquid flow from an upper to a lower level, comprising:

(1) an essentially flat lower base plate;

(2) two substantially vertical parallel flow channel walls attached to the base plate, restricting the flow of liquid to the channel formed by the base plate and the flow channel walls;

(b) an essentially rectangular flow control plate adaptably sized to fill the flow channel created by the base plate and the flow channel walls, wherein said rectangular flow control plate further comprises:

(1) a base hinging means for hinging and pivoting the rectangular plate along an axis on the base plate perpendicular to the direction of the flow of the liquid through the flow channel;

(2) a positional locking means for pivotally positioning the flow control plate along a plurality of positions between a horizontal and vertical position, wherein said flow control plate provisional locking means further comprises:

(i) a pair of bolts, each extending outward, to the flow channel walls, from upper corners of the pivoting flow control plate; a pair of housings to slidably receive, at least in part, the pair of bolts, the housings being fixedly attached to corresponding upper corners of the flow control plate and a compression spring means for forcing the bolt engagingly outward from the flow control plate against the side walls of the flow channels;

(ii) a radially swept arc embedded in the flow channel wall, wherein said arc provides: a repeated embedded pattern of a multiplicity of teeth sizingly corresponding to the teeth on the bolt, wherein said radially swept arc corresponds to each position of the flow control plate between its horizontal and vertical position;

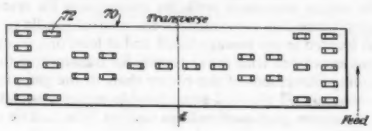
(3) a sealing means for sealing the sides and bottom of the flow control plate against the fluid flow.

4,549,838

METHOD OF MANUFACTURING A CONNECTOR PLATE, CONNECTOR PLATE AND MACHINE FOR MANUFACTURING CONNECTOR PLATE

Robert W. Birckhead, Pompano Beach, Fla., assignor to Alpine Engineered Products, Inc., Pompano Beach, Fla.

Filed Nov. 14, 1980, Ser. No. 206,866
Int. Cl.[4] F16B *5/00, 15/00*
U.S. Cl. 411—468 **3 Claims**



1. A minimum area truss plate for withstanding a predetermined tension load and connecting a pair of abutting base members, said truss plate comprising:

a generally flat plate having a longitudinal axis and transverse center line,

a plurality of slot means to transfer all or part of said tension load to said base members, formed in a predetermined pattern, each slot means with at least one tooth projecting downwardly from one end of said slot means and formed by the material from said slot means,

said slot means formed in a plurality of columns to constitute said pattern,

a single slot in the first column on each side of said transverse center line, and

said plurality of columns being disposed on either side of and generally parallel to said center line, said columns being located sequentially along and generally perpendicular to said longitudinal axis, wherein:

each said plurality on said either side of said centerline is comprised of a first column and a plurality of other columns, said first column being located immediately adjacent to said center line, wherein the number of slot means in each of said other columns successively distant from said centerline in the direction of said longitudinal axis is selected so that each succeeding said other column has the largest number of slot means permitted so that the lessening of said truss plates ability to withstand tension at said each succeeding other column due to said each succeeding other column having more slot means than said first column is less than or equal to the amount of said tension load transferred to the base members by all teeth between said each succeeding column and said center line.

4,549,839

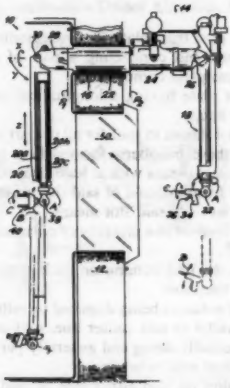
MASTER-SLAVE TELESCOPIC REMOTE MANIPULATOR

Charles Glachet; Daniel Francois, both of Vendome; Jean Tentelier, La Ville aux Clercs Moree, and Christian Frioux, Vendome, all of France, assignors to Commissariat a l'Energie Atomique, Paris and La Calhene Societe Anonyme, Bezon, both of, France

Filed Jan. 26, 1983, Ser. No. 461,031
Claims priority, application France, Feb. 3, 1982, 82 01712
Int. Cl.[4] B25J *3/00*
U.S. Cl. 414—7 **7 Claims**

1. A telescopic remote manipulator comprising a block for passing through a partition which rotates about its own axis, a telescopic master arm constituted by an upper segment and a lower segment and a telescopic slave arm constituted by an upper segment, an intermediate segment and a lower segment, said arms having two longitudinal axes and being articulated by their upper segments on the passage block about two shoulder pins orthogonal to the block axis, a control handle mounted at the free end of the master arm, a gripping member

mounted at the free end of the slave arm, means for transmitting to the slave arm movements imparted to the master arm, means for transmitting to the gripping member movements imparted to the control handle, and means for displacing the slave arm relative to the master arm making it possible to modify the length and orientation of the arm about its shoulder pin and about the axis of the passage block without modifying the corresponding coordinates of the master arm, the means for transmitting to the gripping member movements imparted to the handle comprising, for each movement, at least one first cable means associated with the master arm for transmitting the corresponding movement of the control handle to a rotary shaft located in the passage block and at least one second cable means associated with the slave arm for transmitting the corresponding movement of the rotary shaft to the gripping member, wherein all the said second cable means associated with the slave arm pass over pulleys carried by a mobile carriage



positioned externally of the slave arm and then on pulleys mounted on the slave arm in the vicinity of its shoulder pin in order to directly control the gripping member or the lower segment of the slave arm, and wherein means are provided for displacing the carriage along the slave arm, when there is a variation in the length of said slave arm which can be controlled by said means for transmitting to the slave arm movements imparted to the master arm and by said means for displacing the slave arm relative to the master arm, in the opposite direction of movement of the slave arm and over a distance equal to half said length variation, and wherein the means for displacing the carriage comprises an opposing cable means, whose ends are fixed respectively to the lower end of the upper segment and to the upper end of the lower segment of the slave arm, and which successively passes onto pulleys respectively mounted on the carriage and at the lower end of the upper segment, the upper end of the intermediate segment and the lower end of the intermediate segment of the slave arm.

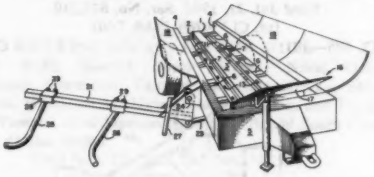
4,549,840

SELF-LOADING CARRIAGE FOR ROUND BALES

Jan Ansbjer, Skogsvillan, S-465 00 Nossebro, Sweden

Filed Apr. 2, 1984, Ser. No. 596,145
Int. Cl.[4] A01D *87/12*
U.S. Cl. 414—24.5 **10 Claims**

1. A self loading carriage for cylindrical bales (B) adapted to be coupled to a tractor and to be operated via the power take-off thereof, characterized in that the carriage frame, constructed from section elements, comprises at least one stationary center support frame member (1) extending along the longitudinal center line of the carriage, said at least one center frame member offering a supporting surface for cylindrical bales (B) hoisted from the ground and loaded on the carriage, with their axes substantially parallel with the longitudinal axis of the carriage, by a hoisting device located at the forward end of the carriage with respect to the intended driving-direction thereof and at one side of the carriage and operated from the power take-off thereof, said at least one center member providing a supporting surface for round bales upon which the latter are slideable, and that adjacent said suporting surface at least one member (7), having a surface extending in a plane below the plane of said supporting surface reciprocatable in the longitudinal direction of the carriage is provided, said at least one member (7) comprising conveying means including a pusher (16) associated with at least one forward end of said at least one



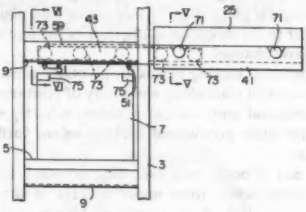
member (7) and drivers (14) extending from said surface of said at least one member (7), said drivers (14) protruding only slightly above said surface of said at least one member (7) and in an inactive position during a first stroking motion of said at least one member (7) so that said pusher (16) can convey a bale a first distance along said stationary center support frame member (1), and said drivers (14) being rotatable by said bale to a substantially vertical position above said surface of said at least one member (7) and in an active position during a second stroking motion of said at least one member (7) so that said drivers (14) can convey said bale a second distance along said stationary center support frame member (1).

4,549,841

CONTAINER STORAGE SHED INSTALLATION

Ryohei Ishige, Hiraki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 26, 1982, Ser. No. 444,386
Claims priority, application Japan, Dec. 2, 1981, 56-192927
Int. Cl.[4] B65G *1/20*
U.S. Cl. 414—282 **2 Claims**



1. A container storage shed installation for storing containers comprising:

rails laid on a floor;

shelves on said floor, each of said shelves having a plurality of container storage zones arranged horizontally and vertically along said rails;

a crane movably supported on said rails;

an elevating member on said crane for effecting a vertical elevating movement;

a spreader frame mounted on said elevating member for movement in a horizontal direction toward said shelves;

brackets on the spreader frame capable of moving vertically;

twist lock pins each twistably attached to one of said brackets;

guides located horizontally on each of said shelves for permitting a horizontal movement of said spreader frame while preventing a a downward movement of said spreader frame;

wherein each of said twist lock pins is connected to a motor through a gear, said motor being mounted on said bracket suspended from said spreader frame through piston-cylinder means; and

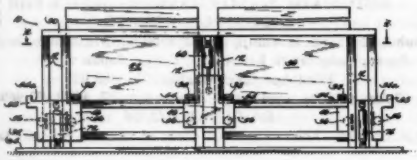
wherein said spreader frame is in the form of an inverted substantially U-shaped member for enclosing said brackets at one side thereof, said spreader frame having attached to an inner side thereof a plurality of guide plates arranged in face-to-face relationship to said bracket for guiding the same for movement in a vertical direction.

4,549,842

CARGO CONTAINER LIFT DEVICE

David Tidmarsh, 3509 N. Hackett Ave., Milwaukee, Wis. 53217

Filed Apr. 21, 1983, Ser. No. 487,879
Int. Cl.[4] B65G *67/02*
U.S. Cl. 414—391 **5 Claims**



1. A device for lifting and lowering a demountable cargo container from and onto a transportation vehicle with a plurality of movable support means connected to and extending laterally outward from opposite sides of said cargo container, said device comprising

at least two pair of opposed, transversely spaced, upright posts defining an elongate bay having a longitudinal axis and into and out of which the transportation vehicle can be driven, each of said posts including upper and lower ends,

strut means interconnecting said posts and including lower strut means interconnecting said lower ends of said posts and adapted to rest on a substantially flat surface,

a pair of vertical plates extending generally parallel to the longitudinal axis of the bay and slidably mounted on each of said posts and guided thereby for reciprocative vertical movement relative to the respective post, at least one of said plates in each pair including an edge portion which engages one of the corresponding laterally extending support means for lifting and lowering the cargo container in response to movement of said plates,

a hydraulic ram connected between each of said posts and each of said pairs of plates for effecting vertical reciprocative movement of said plates, each of said hydraulic rams including an extendable and retractable piston rod with said hydraulic rams on each side of the bay being connected to said posts and said plates so that said piston rod of one of said hydraulic rams extends and said piston rod of the adjacent one of said hydraulic rams retracts to raise the respective plates and said piston rods move in the reverse direction to lower the respective plates,

means for counteracting a turning moment exerted on said plates by the cargo container through the support means, said counteracting means comprising a wheel rotatably mounted on each of said plates adjacent to said posts and positioned so as to bear against said posts and counteract the turning moment exerted on said plate by the cargo container through the support means, and

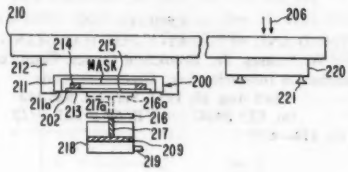
hydraulic control means for selectively moving said piston rods on both sides of the bay in unison throughout the travel of said piston rods and for selectively operating said piston rods on either side of said bay independently of piston rods on the other side of the bay at any point in the travel of said piston rods.

4,549,843

MASK LOADING APPARATUS, METHOD AND CASSETTE

Peter R. Jagusch, and W. Thomas Novak, both of San Jose, Calif., assignors to Micronix Partners, Los Gatos, Calif.

Filed Mar. 15, 1983, Ser. No. 475,439
Int. Cl.[4] H01L *21/02*
U.S. Cl. 414—416 **17 Claims**



1. A mask transport apparatus comprising:

a fixed support member;

a semiconductor wafer mask-holding cassette having an cassette cover with an open-bottom adapted to be held by said support member;

said cassette including a flat cassette bottom tray extending across said cover open-bottom, said cassette tray adapted in use to carry a mask on a top surface of said cassette tray;

tray locking means for locking and unlocking said cassette tray with respect to said cassette cover;

tray support means positionable against the underside of said cassette tray and operable in the unlocked mode of said cassette tray for abutting a bottom surface of said cassette tray and for supporting said cassette tray; and

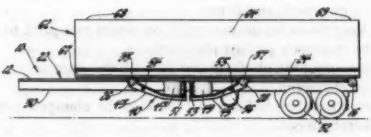
means for separating said cassette tray from said cassette cover by relative movement of said tray support means and said cassette cover such that said cassette tray is moved out of and away from said cassette cover.

4,549,844

ROLLER BED VEHICLE

Thomas P. Miller, 601 N. Brown St., Mt. Pleasant, Mich. 48858

Filed Dec. 27, 1983, Ser. No. 566,151
Int. Cl.[4] B60P *1/52*
U.S. Cl. 414—534 **5 Claims**



1. A vehicle having front and rear ends connected by a vehicle axis comprising, in combination, a load bed which includes a frame and a bed top surface having at least one roller opening, a wheel assembly secured to said bed for transporting said vehicle on the ground, an end roller secured to said bed and having an axis at right angles to said vehicle axis so as to extend above said bed top surface at said rear end of said vehicle a predetermined height; an array of selectively elevatable rollers which are each defined by an axis at right angles to said vehicle axis and which are each selectively elevatable above said bed top surface and selectively lowerable below said bed top surface; and a roller actuator mechanism array which includes an array of actuator arms which are each pivotally secured to said bed and which each support one of said

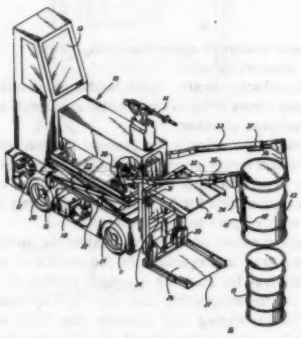
rollers in one of said roller openings and an array of selectively energizable actuators which selectively move each of said actuator arms about said pivots so as to selectively elevate and lower said elevatable rollers above and below said predetermined height, thereby facilitating sliding a load onto said bed in a direction substantially parallel to said vehicle axis by sliding said load across said end roller and across said elevatable rollers when said elevatable rollers are above said bed top surface gravity assist unloading and facilitating transportation of said load by lowering said elevatable rollers below said bed top surface so as to support said load on said bed top surface and said end roller while transporting said load.

4,549,845

METHOD AND APPARATUS FOR HANDLING DRUMS

Robert W. Ramsey, Jr., Brookfield Center, Conn., assignor to Automation Industries, Inc., Greenwich, Conn.

Filed Aug. 25, 1983, Ser. No. 526,443
Int. Cl.[4] B65G 7/02; B66F 9/065, 9/12
U.S. Cl. 414—620 **19 Claims**



1. A method of handling a drum from a first location in an upright position on a floor to a rotated position supported above the floor which comprises

(a) positioning a carrier platform on the floor alongside the drum,

(b) lowering an open-ended overpack vertically over the drum at said first location,

(c) moving the platform toward the drum while translating the overpack with respect to the platform so that the overpack and drum therewithin maintain their position on the floor at said first location and the platform slides under the overpack and drum,

(d) lowering a lid downwardly onto said overpack to clamp the overpack against the platform,

(e) elevating the platform and lid with the clamped overpack therebetween, and

(f) rotating the platform and lid with the clamped overpack therebetween.

12. Apparatus for handling a drum from a first location in an upright position on a floor to a rotated position supported above the floor comprising

(a) a powered steerable vehicle,

(b) movable driven frame means on said vehicle adapted for vertical displacememt with respect to the vehicle,

(c) a carrier platform rotatably mounted on the frame and disposable in a horizontal position addjacent the floor alongside the drum so that it may slide over the floor and under the drum,

(d) lifting arm means pivoted at one end to and slidable along said frame,

(e) support link means longitudinally slidable on the opposite end of the lifting arm means,

(f) drive means for translating said arm and link means into selected positions with respect to the frame and to one another,

(g) an open-ended overpack supported vertically by said link means and adapted to be lowered over said drum,

(h) detachable connector meeans on each side of said overpack for attachment to said link means at selected positions both above and below the horizontal centerline of the overpack, and

(i) a link movable on said frame toward and away from said platform for clamping the overpack therebetween,

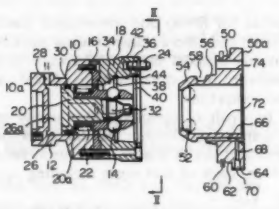
(j) whereby the overpack can be lowered vertically over the drum by pivoting the arm and link means and can be held fixed in relation to the first drum location as the carrier platform is caused to slide under the overpack by forward motion of the vehicle toward the drum location as the carrier platform is caused to slide under the overpack by forward motion of the vehicle toward the drum whereupon the lid can be lowered to clamp the overpack so that upon detachment of the link means the overpack and the drum therewithin can be lifted and then rotated.

4,549,846

AUTOMATIC HAND CHANGING DEVICE FOR INDUSTRIAL ROBOTS

Nobutoshi Torii, Hachioji, and Ryo Nihei, Musashino, both of Japan, assignors to Fanuc Ltd, Tokyo, Japan

Filed Apr. 25, 1983, Ser. No. 488,079
Claims priority, application Japan, Apr. 27, 1982, 57-969492
Int. Cl.[4] B25J 15/04
U.S. Cl. 414—729 **4 Claims**



1. An automatic hand changing device for an industrial robot, comprising:

a changer unit having a cylindrical body having a cylindrical bore extending axially therein, one end portion of said body being defined by an end surface closing said bore and adapted to be fixedly attached to an end of an arm of an industrial robot, a piston slidably and sealably fitted in said bore, a rear end of said piston defining with said end portion a chamber in said bore and a front end of said piston being formed as a clamp operating means, a ball retainer fixedly attached to the opposite end of said body, a plurality of clamping balls radially movably retained by said ball retainer, spring means in abutting relation between said ball retainer and said piston, said spring means urging said piston in retraction toward said end surface of said body, a first port provided in said body in commuication with said chamber such that fluid under pressure may be admitted through said first port into said chamber for urging said piston in extension against said spring means toward said ball retainer to cause said clamp operating means to displace said plurality of balls radially outwardly, and an annular head fixedly attached with said ball retainer to said opposite end of said body, an interior of said head being provided with first and second radially outwardly tapered conical inner surfaces, said first conical inner surface being formed inwardly of said second conical inner surface and having a greater taper than said second conical inner surface; and

a changer adapter adapted for engagement in said changer

unit and having a hollow annular body having a cylindrical bore, a front end of said body being defined by an end surface adapted for mounting a hand of an industrial robot, a rear end of said body being formed with a tapered end portion having first and second radially outwardly tapered conical outer surfaces, said first conical outer surface being formed rearwardly of said second conical outer surface and having a greater taper than said second conical outer surface, said first and second conical outer surfaces respectively closely corresponding in axial length, diameter and taper with said first and second conical inner surfaces of said head of said changer unit so as to be capable of closely fitting therewith, a rear end of said bore of said adapter having an inner diameter sufficient to fit over a forward portion of said ball retainer of said changer unit when said clamping balls are held radially inwardly therein, and said rear end of said bore of said adapter being formed with a radially outwardly and forwardly tapered engagement surface;

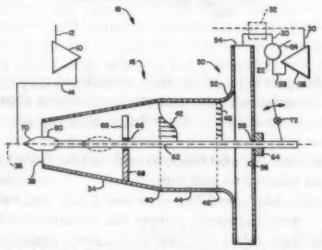
whereby said changer unit may be placed over said changer adapter to engage said changer adapter therein with said first and second conical outer surfaces of said changer adapter in respective fitted relation with said first and second conical inner surfaces of said head of said changer unit, and fluid under pressure may be supplied through said first port of said body of said changer unit to said chamber to extend said piston such that said clamp operating means thereof displaces said plurality of balls radially outwardly into clamping engagement with said engagement surface of said changer adapter to retain said changer adapter in clamped engagement in said changer unit.

4,549,847

HIGH AREA RATIO, VARIABLE ENTRANCE GEOMETRY COMPRESSOR DIFFUSER

Sigmunn Stroem, Kongsberg, and Rolf J. Mowill, Oslo, both of Norway, assignors to A.S. Kongsberg Vapenfabrikk, Kongsberg, Norway

Filed Nov. 3, 1982, Ser. No. 438,990
Int. Cl.[4] F02C 3/10
U.S. Cl. 415—182 **7 Claims**



1. Diffuser apparatus for use in conjunction with a rotary compressor, the apparatus comprising:

(a) a first stage having a smoothly increasing cross-sectional flow area in the direction of flow, said first stage having an entrance for receiving gas at a relatively high velocity from the compressor and also having an exit,

(b) a plate-type radial diffuser stage positioned downstream of said first stage along the gas flow path through the diffuser, said radial stage having an axial inlet and radial outlet, said radial stage also having an impact surface mounted substantially orthogonal to the fluid flow direction in said axial inlet for turning the fluid flow into said radial outlet, and

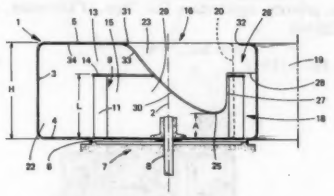
(c) transition means operatively connecting said first diffuser stage to said plate diffuser stage for channeling gas flowing from said first stage exit to said plate stage inlet, reducing spatial variations in the gas velocity profile exiting said first stage, and recovering kinetic energy as a consequence of said reduced volocity profile spatial variations.

4,549,848

ARRANGEMENT FOR RADIAL FANS

Lennart Wallman, Harstenagatan 2, S-582 73 Linkoping, Sweden

PCT No. PCT/SE83/00012, § 371 Date Sep. 21, 1983, § 102(e) Date Sep. 21, 1983, PCT Pub. No. WO83/02646, PCT Pub. Date Aug., 1983
PCT Filed Jan. 19, 1983, Ser. No. 545,381
Claims priority, application Sweden, Jan. 21, 1982, 8200317
Int. Cl.[4] F04D 29/44
U.S. Cl. 415—206 **7 Claims**



1. A radial flow fan having a fan wheel (9) which rotates in one direction on an axis (2) and which comprises a ring of circumferentially spaced blades (11), each extending between a disc-like axially inner end plate (10) and a concentric axially outer end ring (14) through which air flows to the inside of the ring of blades (11) to be propelled radially outward by them, and a housing (1) within which the fan wheel (9) rotates and which has an inner end wall (4) that is substantially coplanar with said inner end plate (10), an outer end wall (5) which is spaced axially outwardly from said end ring (14) and wherein there is an air inlet (16), and a spiral side wall (3) which extends around the fan wheel (9) in divergent relation to the fan wheel periphery from a tongue (20) location to an outlet (21) and which cooperates with said end walls (4, 5) and the ring of blades (11) to define a duct (18) around the fan wheel (9), said duct (18) merging at said outlet (21) into an outlet pipe (19) which is joined to the side wall (3) at said tongue (20) location and serving to conduct to said outlet pipe (19) air propelled through the ring of blades (11), said fan being characterized by:

A. said fan wheel (9) having an axial length (L) which is between 80% and 120% of its radius (R);

B. said duct (18)

(1) being of continuously increasing cross-section area in said direction of fan wheel (9) rotation from said tongue (20) location to said outlet (21) and

(2) having at said outlet (21) a cross-section area at least equal to the radius (R) of the fan wheel times its axial length (L);

C. a vane (23) connected to said outer end wall (5) and projecting obliquely axially inwardly therefrom and away from said outlet (21) into the ring of blades (11) for guiding incoming air into the ring of blades at the portion thereof that is remote from said outlet (21), said vane (23)

(1) having a substantially straight side edge (27) that lies closely adjacent along its length to the ring of blades (11) at the inside thereof, and

(2) having an inner end edge (25) which extends from the axially inner end of said side edge (27) substantially radially inwardly away from the ring of blades;

D. said air inlet (16) being defined by

(1) said vane (23), and

(2) an arcuate radially inwardly facing edge (32) of said outer end wall (5) which extends around not substantially more than half of the circumference of the ring of

blades (11) and is substantially entirely at the side of said axis (2) that is remote from said outlet (21); and

E. a baffle (26) projecting edgewise substantially radially from said vane (23) and extending across said ring of blades (11) towards said spiral side wall (3), said baffle having

(1) an axially inner edge (28) adjacent to said end ring (14) and extending radially outwardly from the axially outer end of said side edge (27), and

(2) an opposite outer edge adjacent and substantially parallel to said outer end wall (5).

4,549,849

PUMPING ASSEMBLIES

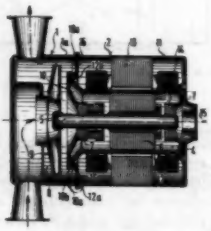
Niels D. Jensen, and Kurt F. Nielsen, both of Bjerringbro, Denmark, assignors to Grundfos A/S, Bjerringbro, Denmark

Filed Apr. 11, 1983, Ser. No. 483,677

Claims priority, application Fed. Rep. of Germany, May 29, 1982, 3220448

Int. Cl.⁴ F04D *29/40*

U.S. Cl. 415—219 R **6 Claims**



1. In a pumping assembly for heating and faucet water plants of the kind comprising a wet-armature motor and a centrifugal pump driven thereby, and connected pump and motor casings pressed to shape from metal plates, said pump casing having an axially oriented collar which bears and encompasses a marginal area of a partition delimiting a pumping space from a motor space and which is joined by a weld joint to an encircling marginal area of a split tube separating an armature space from a stator space, the invention which consists in that said partition and said split tube are joined at least by partial weldings in their mutual contact area to provide a structural unit ready for installation and including the armature end thereof, said structural unit conjointly with said armature being joined to said pump casing by a liquid-tight pressure weld joining said pump casing collar to said marginal area of said split tube.

4,549,850

HELICOPTER ROTORS

Alan H. Vincent, Somerset, England, assignor to Westland plc, Somerst, England

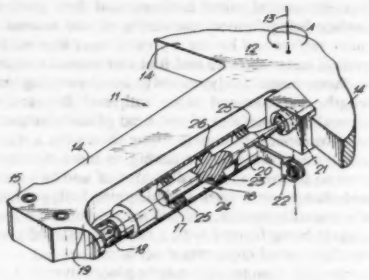
Filed Jul. 23, 1984, Ser. No. 633,420

Claims priority, application United Kingdom, Aug. 22, 1983, 8322518

Int. Cl.⁴ B64C *27/38, 27/72*

U.S. Cl. 416—140 **6 Claims**

1. A bearingless helicopter rotor including, for each of a plurality of rotor blades, a flexure member extending radially between a rotor hub and a blade attachment, said flexure members being flexible in torsion to permit blade pitch changes and in the flap and lead/lag planes to permit operational deflections, and an integral damper and pitch change assembly located externally of each flexure member in the plane of rotation of the rotor and comprising a generally tubular body portion closed at one end, torque transmitting means attaching said tubular body portion to the flexure member blade attachment, a rod protruding axially from the other end of the body portion and attached adjacent the rotor hub so that the assembly extends generally parallel to the associated flexure member, a pitch change arm rotationally fixed to the tubular body and adapted for connection to pitch change means to rotate the



body about its longitudinal axis to change the pitch of the rotor blade, and damping means operative between the rod and the body portion to damp lead/lag movements of the rotor blade.

4,549,851

HELICOPTER ROTOR

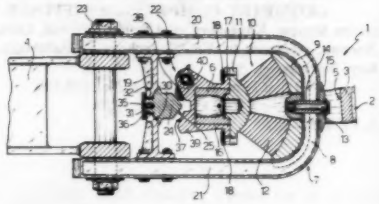
Emilio Pariani, Cardano Al Campo, Italy, assignor to Costruzioni Aeronautiche Giovanni Agusta S.p.A., Italy

Filed May 2, 1984, Ser. No. 606,183

Claims priority, application Italy, May 5, 1983, 67486 A/83

Int. Cl.⁴ B64C *27/38*

U.S. Cl. 416—140 **5 Claims**



1. A helicopter rotor of the fully articulated type comprising a central hub adapted to be mounted for rotation about an axis;

at least one blade projecting substantially radially from said hub;

means connecting said blade to said hub for fully articulated motion relative to said hub;

stop means interposed between said blade and said hub to limit to predetermined extents the articulated movements of said blade relative to said hub in static conditions and in dynamic conditions respectively and in a plane substantially parallel to the axis of rotation of the hub;

said connecting means comprising a bridge element extending along a periphery of the hub and rigid therewith, a U-shaped fork extending about said bridge element and outwards therefrom in a substantially radial direction, coupling means connecting an open outer end of said fork to an inner end of said blade, and an elastomeric bearing interposed between said fork and said bridge element for fully articulated motion of said fork relative to said bridge;

said stop means comprising a pin having an axis extending in a substantially radial direction relative to said hub and arranged outside said bridge element, said pin being supported by said fork for rotation about its axis and having a faceted free end portion facing said bridge element and substantially shaped as a polygonal pyramid, a fixed lower

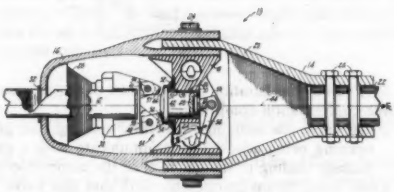
stop member supported by said bridge element and positioned thereon to engage said faceted free end portion of said pin when said blade drops downwardly to a selected first angle, and a centrifugally responsive upper stop member supported by said bridge element and mounted for movement relative thereto between a first position in which said upper stop member engages said faceted free end portion of said pin when said blade moves upwardly to a selected second angle, and a second position in which said upper stop member is arranged outside a space region swept by said faceted free end portion during movement of said blade upwards.

4,549,852

HELICOPTER BLADE DROOP STOP WITH SLIDABLE DROOP STOP SEAT

Edward S. Hibyan, Trumbull, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 16, 1983, Ser. No. 562,056
Int. Cl.⁴ B64C *27/38*
U.S. Cl. 416—140 **8 Claims**



1. In a helicopter rotor hub assembly of the type having a plurality of rotor blades extending outwardly from a central hub, each blade joined thereto at an elastomeric bearing permitting universal movement of the mounted blade with respect to the hub, improved apparatus for supporting the blades under static and dynamic blade loads comprising:

a droop stop mounted on the rotor hub and facing outwardly toward the airfoil section of the rotor blade to be supported; and

a droop stop seat attached to the base of the rotor blade to be supported and having a conical surface at one end thereof facing inwardly toward the rotor hub in opposition to the fixed droop stop, wherein the droop stop seat is mounted on the pitch axis of the blade and is slidable along the pitch axis to a first position for limiting, in conjunction with the droop stop, blade droop under statically loaded conditions and to a second position for limiting, in conjunction with the droop stop, blade droop under dynamically loaded conditions.

4,549,853

POSITIVE DISPLACEMENT PUMP OUTPUT MONITOR

Kenneth E. Gasper, Leawood, and Raymond G. Ehrhart, Overland Park, both of Kans., assignors to Olin Corporation, Cheshire, Conn.

Filed Apr. 2, 1984, Ser. No. 595,808
Int. Cl.⁴ F04B *21/00*; G08B *21/00*
U.S. Cl. 417—53 **6 Claims**

1. An output monitor positioned on the fluid discharge line of a positive displacement pump comprising

a pulse receiving chamber attached to said discharge line of said positive displacement pump and through which the pumped fluid passes through, a portion of said pulse receiving chamber comprising a diaphragm capable of moving outward from the fluid in response to the increased pressure of the fluid during the discharge stroke of said pump;

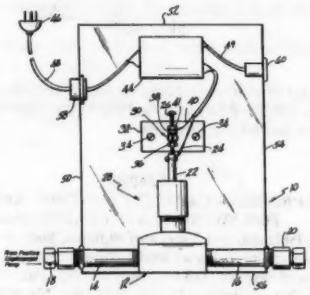
a spring-loaded shaft in communication with said diaphragm and which moves outward concurrently with the movement of the diaphragm;

a fixed element which is contacted by said spring-loaded metal shaft when said diaphragm is moved outward by the increased pressure of the fluid during the discharge stroke of the pump;

a time-delayed powered relay connected to said fixed element and when contact is made between said spring-loaded shaft and said fixed element, an electric current is passed to said time-delayed relay to said relay; and

said time-delayed relay capable of sending an alarm signal to an alarm annunciation means if said relay is not reset within a predetermined amount of time.

6. A method for monitoring the output of a positive displacement pump comprising:



(a) passing the discharged fluid from a positive displacement pump through a pulse receiving chamber positioned on the fluid discharge line of said pump, the pressure of said pumped fluid during the discharge stroke of the pump causing a diaphragm in said pulse receiving chamber to be moved outwardly by said fluid;

(b) causing the outward concurrent movement of a spring-loaded metal shaft when the diaphragm is moved outwardly;

(c) contacting a fixed element with said outwardly moved spring-loaded shaft, thereby causing a time-delayed relay connected to said fixed element to be reset; and

(d) causing said time-delayed relay to send an alarm signal to an alarm annunciation means if said relay is not reset within a predetermined amount of time.

4,549,854

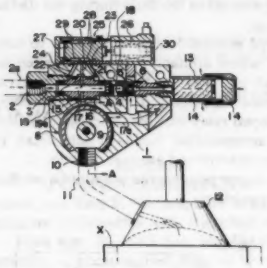
VACUUM GENERATING DEVICE

Shoji Yamamoto, Tokyo, Japan, assignor to Kabushiki Kaisha Myotoku, Tokyo, Japan

Filed Apr. 13, 1984, Ser. No. 599,998
Claims priority, application Japan, Apr. 15, 1983, 58-56391[U]
Int. Cl.⁴ F04F *5/48*
U.S. Cl. 417—187 **3 Claims**

1. A vacuum control device comprising a body having an inlet port adapted for connection to a source of air under pressure and an outlet port for connection to a suction pad, a bore formed in said body receiving air from said inlet port, a piston located in said bore and having a central through passage for said air, said piston and said bore defining an expansion chamber at the rear end and an expansion chamber at the front end of said bore, an air jet ejector axially aligned with the front end of said bore comprising a nozzle and an aspirator chamber surrounding said nozzle, and duct means for communication of said aspirator chamber with said outlet port, said piston having a seal at its forward tip and being movable between a first position wherein said tip is spaced from said nozzle permitting said air under pressure to flow into said nozzle to create a

vacuum in said aspirator chamber, and a second position wherein said seal seats against the rear end and of said nozzle to block the flow of air under pressure to said nozzle, and



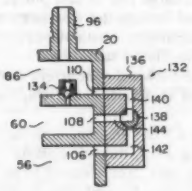
means for selectively feeding air under pressure to the front and rear chambers to move said piston into one or the other of said first and second positions.

4,549,855

COMPRESSION CAPACITY CONTROL APPARATUS FOR SWASH PLATE COMPRESSOR

Yutaka Ishizuka, and Tsunenori Shibuya, both of Saitama, Japan, assignors to Diesel Kiki Company, Ltd., Tokyo, Japan

Division of Ser. No. 413,642, Sep. 1, 1982, Pat. No. 4,511,313.
This application Feb. 5, 1985, Ser. No. 698,295
Claims priority, application Japan, Sep. 11, 1981, 56-143525
Int. Cl.[4] F04B *1/28, 49/08*
U.S. Cl. 417—270 **2 Claims**



1. In a swash plate compressor having a cylinder block, front and rear covers mounted on the opposite ends of the cylinder block, each front and rear covers being formed with a low pressure chamber for temporarily storing an incoming gas, a high pressure chamber for temporarily storing an outgoing gas and a deliver conduit for delivering the outgoing gas, a compression capacity control apparatus comprising:

a delivery chamber formed in one of the front and rear covers to be communicated with the high pressure chamber in the other cover, the delivery chamber being isolated from the high pressure chamber in said one cover and being connected with the delivery conduit;

a compression capacity control passageway providing communication between the delivery chamber and the high pressure chamber in said one cover and communication between the high and low pressure chambers in said one cover;

valve means comprising a rotary valve member disposed in the control passageway and operable to block communication between the delivery chamber and the high pressure chamber of said one cover while unblocking the communication between the high pressure chamber and the lower pressure chamber of said one cover; and

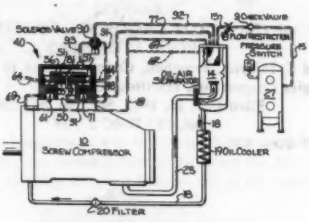
a relief valve for communicating to the delivery chamber an elevated pressure in the compression chamber of said one cover while the valve means shifts from one position to another.

4,549,856

COMPRESSOR CONTROL SYSTEM

John Cash, and John A. Kitchener, both of Richmond, Australia, assignors to Cash Engineering Co. Pty. Ltd., Richmond, Australia

Filed Mar. 2, 1984, Ser. No. 585,787
Claims priority, application Australia, Apr. 8, 1983, PF8807
Int. Cl.[4] F04C *29/08, 18/16*
U.S. Cl. 417—295 **17 Claims**



1. A valve configuration for a gas inlet of a compressor, said valve configuration comprising:

a first valve seat defining a gas flow opening, said gas flow opening being adapted to communicate with a gas flow passage leading to the gas inlet of the compressor;

a first valve means co-operable with said first valve seat to open or close said gas flow opening, said first valve means having a first face directed towards said first valve seat and a second face directed away from said first valve seat;

a first zone separate from said gas flow passage arranged adjacent to said second face of said first valve means whereby pressure conditions in said first zone are applied over an effective area of said second face greater than the area of said gas flow opening;

first communication means adapted to communicate pressure conditions in said gas flow passage to said first zone whereby vacuum conditions existing in said gas flow passage communicated to said first zone effects movement of said first valve means fully away from said first valve seat;

second communication means adapted to selectively supply gas at a predetermined pressure to said first zone to establish a pressure differential across said first valve means towards said first valve seat to thereby effect closure of said first valve means against said first valve seat; and

pressurized gas supply means adapted for communication with the gas inlet of the compressor when said first valve means is initially engaged against said first valve seat to close said gas flow opening thereby reducing vacuum conditions in said gas inlet of the compressor.

4,549,857

HERMETIC MOTOR COMPRESSOR HAVING A SUCTION INLET AND SEAL

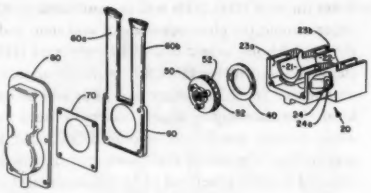
Tadek M. Kropiwnicki, and Joseph E. Braymer, both of Syracuse, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Aug. 3, 1984, Ser. No. 637,364
Int. Cl.[4] F04B *39/00, 39/10*
U.S. Cl. 417—312 **1 Claim**

1. In a hermetic compressor assembly including a shell containing a compressor having a cylinder block, a cylinder head, a pumping chamber formed by a cylinder in the cylinder block, a pumping member in the form of a piston, suction and discharge valves and an electric motor, the improvement comprising a member defining both a suction inlet and a seal comprising:

a housing means located between the cylinder head and the cylinder block and defining an opening for receiving the suction valve in a radially spaced relationship with said opening so as to define therewith a space to permit fluid communication to the suction valve; and

a plurality of suction gas supply means in the shell for delivering gaseous refrigerant from within the shell to said space defined by said radially spaced relationship for delivery to the suction valve with each of said plurality of suction gas supply means including a long narrow tube having a flared inlet and a turned length and terminating in a throat to increase gas velocity into the space defined by said radially spaced relationship.



4,549,858

FLAT TYPE FAN, PARTICULARLY FOR ELECTRONIC CIRCUITS

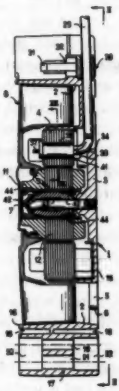
Claude Vettori, Le Kremlin Bicetre, and Henri Chauviere, Courbevoie, both of France, assignors to Etudes Techniques et Representations Industrielles E.T.R.I., Neuilly sur Seine, France

Continuation of Ser. No. 363,432, Mar. 30, 1982,. This application Apr. 26, 1985, Ser. No. 727,606

Claims priority, application France, Apr. 3, 1981, 81 06711

Int. Cl.[4] F04B *35/04*

U.S. Cl. 417—353 **9 Claims**



1. In a flat type fan having a casing (1), a motor with a stator (4), a rotor (12) and a fan blade unit (8) integral with said rotor, said casing (1) being made from a moldable material and having a periphery constituted only by a cylindrical duct (2) and carrying in its central part a support (3) comprising a cavity adapted to receive the stator (4), said support being connected by radial arms (5, 5*a*) to the duct, the improvement comprising, on the periphery of the casing, two diametrically opposite fixing bosses (17) each having therethrough at least one fixing passage (19, 21) parallel to the axis of the cylindrical duct (2), said bosses (17) extending over the whole length of the cylindrical duct (2) defined by the casing along the axis of said duct, each of said fixing bosses (17) being integral with the casing through a single web (13 or 14) disposed perpendicularly to the axis of the fan, said web (14) carrying an additional boss (23) having therethrough a passage (25) parallel to the axis of the fan for receiving a ground connection (57), said web (14) comprising a hole (27) parallel to the axis of the fan for fixing a collar (28) for clamping supply wires (29), one (5*a*) of said arms connecting said support (3) to said duct (2) being adjacent to said web (14) comprising said hole (27) and being hollowed out to form a gutter serving as a housing for said supply wires (29), said gutter communicating with a hole (34) provided in said support (3).

4,549,859

SUSPENSION SYSTEM FOR HERMETIC MOTOR-COMPRESSORS OF REFRIGERATORS AND THE LIKE

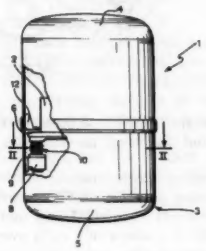
Norbert Andrione, and Federigo Peruzzi, both of Turin, Italy, assignors to Aspera S.p.A., Italy

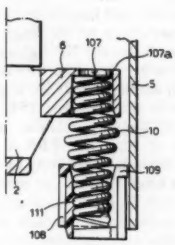
Filed May 25, 1984, Ser. No. 614,193

Claims priority, application Italy, Jul. 12, 1983, 67754A/83

Int. Cl.[4] F04B *35/04;* **F16M** *13/00;* **F16F** *1/12*

U.S. Cl. 417—363 **8 Claims**





1. A hermetic motor-compressor comprising a casing formed by upper and lower super-imposed cup-shaped bodies having sidewalls with the sidewalls connected together in a frontal mating position to define a hollow chamber, a motor-compressor unit disposed within said casing and a suspension system for resiliently supporting said unit within said casing; said suspension system comprising at least three radially directed support arms extending from said motor compressor unit with each arm having a free end with a vertically oriented aperture therein, tubular support brackets secured to the sidewall of said lower body at locations corresponding to the free end of each arm, a bush of plastic material having a cavity therein secured within each tubular support bracket with said cavity axially aligned with said aperture of the support arm overlying said bracket, helical springs each having an upper end and a lower end with the upper end of each helical spring being lodged in the aperture of a respective support arm and

internal threads formed in the cavity of each bush into which the lower end of each helical spring is threaded.

4,549,860

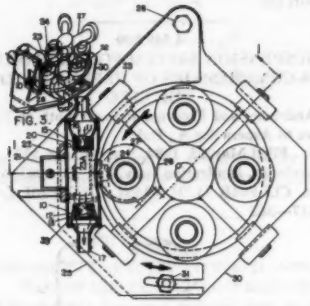
BLOOD PUMP IMPROVEMENTS

Sam S. Yakich, 830 S. Saratoga Ave. Apt. C-103, San Jose, Calif. 95129

Continuation-in-part of Ser. No. 481,712, Apr. 4, 1983, abandoned. This application Nov. 19, 1984, Ser. No. 672,815

Int. Cl.[4] F04B *43/12*

U.S. Cl. 417—475 **1 Claim**



1. A peristaltic type blood pump (in brief PBP) of a pressure pulsating kind that needs no occlusion adjustments consisting of:

a prime mover electric motor;

a PBP sliding plate (in brief SP) carrying one or more PBP tube elements (in brief BPTE), said SP has a base plate (in brief BP) in a shape of a right even sided triangle with a large semicircular hole, center of which is located at midpoint of said triangle's diagonal, one pivot hole of said SP located at one 45° corner and one slotted hole, 15° of arc long, at the other 45° corner, said arc has a center at said pivot hole, said large hole allows said SP to be placed in $\frac{1}{4}$"-$\frac{3}{4}$" proximity to the later mentioned rollers, said pivot hole allows the SP to swing in an arc getting it closer or further from the rollers, thus enabling side depressions (pumping) of BPTE walls, said slotted hole has a screw in its slot bolted in PSP, when SP is slided in a desired PBP delivery position, said screw prevents the movement of SP while PBP is working, said BP has welded to itself in a proximity of its 90° corner a vertical bracket (in brief VB), one or more rectangular holes are placed on said VB to accept a tab of BPTE, said rectangular holes are placed above each other and spaced in such a way to allow tube reshaping rollers to pass between two BPTE's and in sequence touch only bottom of upper BPTE and then, next tube reshaping roller, only the top of lower BPTE's tube, said VB has welded to itself four horizontal plates (in brief HP), two HP are welded to the inside face of said VB so that one of the HP supports from under the lower BPTE and second HP supports the upper BPTE from the top, third and fourth HP are welded to the outside face of said VB in level with lower edges of said rectangular holes, each of two outside HPs have one hole to match a hole in said tab of each BPTE, one screw and nut are used to attach to VB each of the BPTEs;

a PBP supporting plate (in brief PSP) carrying the prime mover electric motor and PBP sliding plate;

a PBP hub (in brief PH) pressed directly onto the output shaft of said prime mover electric motor, said PH carry four vertical shafts, one end of each shaft is screwed into a horizontal disc (lower part of said PH), disc has four threaded holes 90° apart placed in a circle close to the edge of said disc, upper plain round part of vertical shafts will have four BPTE's compressing rollers slipped onto them and held tight against said shafts by one set screw each, two of said rollers (placed diametrically opposite to each other) will have a vertical shaft longer to allow its roller to engage the upper BPTE, and two others rollers will have shorter shafts to engage the lower BPTE only, the vertical stem (part of PH) has four horizontal threaded holes (in brief HH), HHs will be positioned at 90° to each other around the circumference of said stem and 45° relative to the holes in said disc of PH, also said HHs shall be staggered so that two HHs, diametrically opposite, will be on a higher level, and other two HHs will be on a lower level, thus allowing reshaping rollers to touch one BPTE while passing untouched second BPTE, said HHs will accept four horizontal shafts one end of which will be screwed in HHs, other end of each horizontal shaft will be plain round and have four tube (BPTE) reshaping rollers slipped onto them and held tight by one set screw each;

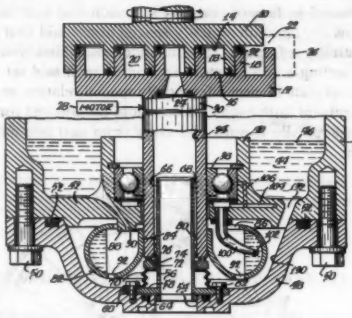
each said BPTE being plastic and straight in shape and comprising a long cylindrical tube (in brief CT), CT has fused to its ends two check valves (in brief CV), one CV is at the inlet, second CV is at the outlet of CT, most of a body of CVs is placed inside the CT, inlet CV has three body elements (in brief IBE), first IBE is a nipple which has tubular outside connector barbed on its outside cylindrical surface to prevent leaks when outside tubing is slipped onto it, first IBE extends to a hollow tubular part forming a chamber, the chamber extends to a hollow truncated conical part, second IBE starts with short tubular part which is welded to truncated hollow cone extended at its smaller diameter to a round plate with a large hole in a center, to seat a CV's spherical ball (in brief SB) from the inside of second IBE, first IBE's flange has welded to itself a first short tubular part of second IBE thus forming the inlet CV chamber, third IBE starts with its tubular part fused to said round plate and extends to another round plate having from inside a short round hump to lock on its one end the CV's helical spring (in brief CVHS), said another round plate has four holes around its edges placed 90° apart in a circular pattern, said CT (inside wall) and outside walls of 1st, 2nd and 3rd IBEs form an inside cylindrical cavity open at one end, together with similar cavity of outlet CV they form with CT of BPTE a "dead flow" zone significant in reducing BPTE's internal friction and turbulence causing hemolysis to blood passing through BPTE, said outlet CV comprises also of three body elements (OBE in brief), third OBE, the nipple is same as first IBE, second OBE has a short tubular cavity, one end of it is welded to the said nipple's flange the other end extends in thin round plate with four holes and an internal round hump similar to plate's shape of 3rd IBE, except that four holes now are semiblind and extending themselves into conical part of second OBE, this conical part is truncated and with also truncated conical cavity at its end, this end is welded to the first OBE, first OBE is a somewhat thicker round plate with large hole in its center, to seat the SB, said nipple, short tubular part and in part truncated conical cavities form the outlet chamber of outlet CV, said CT has at his mid-length point rectangular tab fused to itself, by this tab BPTE is held semiridgidly (due to elasticity of CT walls) relative to PSP, i.e. relative to rollers, this greatly contributes to reduction of stresses in CT and relaibility of BP as a whole, said inlet and outlet CVs in their above described cavities have each one SB and one CVHS, SB is held up against its seat by precompressed CVHS.

4,549,861

ROTATING POSITIVE DISPLACEMENT SCROLL APPARATUS WITH LUBRICATING PUMP

Edward S. Blain, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jun. 28, 1984, Ser. No. 626,537
Int. Cl.[4] F01C *1/04, 19/08, 21/04;* F04D *1/12*
U.S. Cl. 418—55 **11 Claims**



1. A positive displacement machine comprising:

first and second scrolls having interfitting vanes adapted to define at least one travelling pocket in which a fluid may be received, one of said scrolls having a central outlet;

means, including a hollow shaft, mounting said scrolls for rotation, one end of said hollow shaft being connected to said one scroll about said outlet;

a machine housing containing said scrolls and said mounting means and having an outlet port;

a transfer tube stationarily mounted in said housing in fluid communication with said outlet port and extending into the other end of said shaft; and

means sealing the interface of said transfer tube and said shaft, the outer diameter of said transfer tube being sufficiently less than the inner diameter of said shaft so that an annular space exists therebetween; and said sealing means being guided by said transfer tube into sealing engagement with said shaft other end;

means in said annular pace defining a pumping configuration responsive to rotation of said shaft relative to said tube for directing lubricant from a lubricant source through said annular space toward said sealing means.

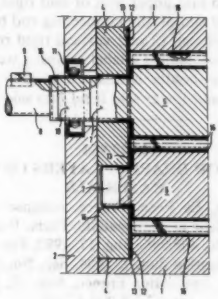
4,549,862

HYDRAULIC PUMP FOR LOW-VISCOSITY PUMPING MEDIA

Bodo Stich, Wiesbaden; Ernst Hassler, Camberg, both of Fed. Rep. of Germany, and Ivan-Jaroslav Cyphelly, Gran Canaria, Spain, assignors to Glyco-Antriebstechnik GmbH, Wiesbaden, Fed. Rep. of Germany

Filed Apr. 9, 1984, Ser. No. 598,372
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1983, 3312868
Int. Cl.[4] F04C *2/18, 15/00*
U.S. Cl. 418—133 **4 Claims**

1. A hydraulic pump comprising a casing, guide members providing radially and axially effective guide means situated in the casing, at least one displacement element provided with journals which are rotatably received in said guide members, a drive shaft extending from outside into the casing, sealed with respect to the casing by a sealing ring and drivably connected to one said journal, the pump including further elements for the displacement process and being so arranged that a hydrodynamic lubricating film is formed between surfaces moving relative to, and in contact with, each other, wherein at least the surfaces of each displcement element, of said journals, of said further elements and of the portion of said shaft inside said



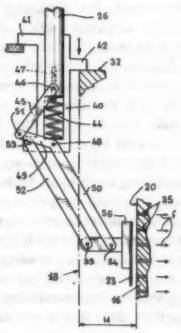
sealing ring are plasma-nitrided and the axially effective guide means are coated with a ceramic material.

4,549,863

PROCESS AND DEVICE FOR DEPOSITING A LABEL ON THE WALLS OF A MOLD OF AN EXTRUSION/BLOW-MOLDING MACHINE

Jacques Bourgeois, Lyons, France, assignor to Serta-Societe d'Etudes et de Realisations des Techniques d'Automatisme, France

Filed Feb. 9, 1984, Ser. No. 578,529
Claims priority, application France, Feb. 22, 1983, 83 03058
Int. Cl.[4] B65C *3/08*
U.S. Cl. 425—126 R **5 Claims**



1. A device for introducing and positioning a label on the walls of a mold formed in two parts separated by a mold joint in a machine with a reciprocating cycle for the extrusion blow-molding of hollow bodies, comprising:

(a) a storage member for storing labels, said storage member being disposed above said mold;

(b) a reciprocating vertically mobile jack disposed above said mold;

(c) a vertical rigid rod, a first end of said vertical rigid rod being connected to said jack, a second end of said vertical rigid rod being surrounded by a hollow mobile extension piece containing a compression spring, said extension piece comprising at its upper end at least one stop, said stop limiting the vertical stroke of said vertical rigid rod by abutting on an upper portion of said mold or on a blowpipe-holder member;

(d) a rigid pivoting member being connected to a lower end

of said extension piece and comprising an upper arm and a lower arm, said lower arm being fixed to a label-holder;

(e) a connecting rod, a first end of said connecting rod being connected to said upper arm of said rigid pivoting member, a second end of said connecting rod being connected to said second end of said vertical rigid rod; and

(f) means for maintaining a label against a wall of said mold;

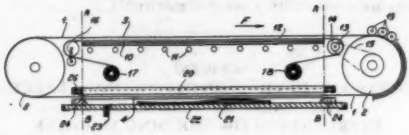
wherein said label-holder is adapted to grip a label in said storage member and lower said label into said mold.

4,549,864

APPARATUS FOR DRAPING LAYERS OF COMPOSITE MATERIALS

André P. Larribe, Le Pecq, France, assignor to Societe Nationale Industrielle et Aerospatiale, Paris, France

Division of Ser. No. 408,996, Aug. 17, 1982, Pat. No. 4,487,730.
This application Jun. 7, 1984, Ser. No. 618,247
Claims priority, application France, Aug. 19, 1981, 81 15910
Int. Cl.⁴ B28B *17/00*
U.S. Cl. 425—145 **11 Claims**



1. Apparatus for draping layers of composite material over moulding equipment, comprising a flexible and pliable transfer band of carrier material having at least one deformable working section of said band, at least two drums for driving said band, first and second working stations between said drums in which second working station said band faces said moulding equipment, driving means for actuating at least one of said drums to cause a said working section of said band to move from said first working station to said second working station, a pattern having thereon an outline of each said layer of composite material, projection means for imaging onto each said working section of said transfer band received in said first working station said outline from said pattern, to facilitate correct location of a said layer on a said working section of said band in said first working station, a support table for supporting said moulding equipment facing said second working station, a support on said support table surrounding said moulding equipment, an outlet in said support table, a reduced pressure source in communication with said outlet, and retractable pressure means for sealingly pressing a said working section against said support surrounding said moulding equipment, said working section, said moulding equipment, and said support table together defining a sealed reduced pressure chamber to deform a said working section of said transfer band, to place and compact a said layer on said moulding equipment or on a said layer previously placed and compacted thereon.

4,549,865

BLOW MOLDING APPARATUS

Robert A. Myers, Perrysburg, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 28, 1984, Ser. No. 594,076
Int. Cl.⁴ B29F *1/00*
U.S. Cl. 425—342.1 **23 Claims**

1. A blow molding apparatus comprising

a frame,

a wheel plate,

a shaft rotatably mounted on said frame and extending horizontally,

means for supporting said wheel plate on said shaft for rotation with said shaft,

a first hub mounted on said shaft for rotation with said shaft,

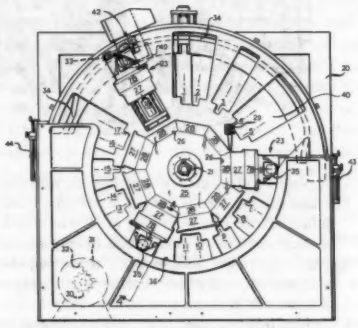
a plurality of sets of molds defining a mold cavity when closed,

each said set comprising a pair of mold sections,

said first hub having circumferentially spaced external surfaces, the number of surfaces corresponding to the number of sets of molds,

one mold section of each said set being mounted on an external surface of said first hub such that said mold sections are circumferentially spaced about said first hub,

a plurality of mold section slide assemblies removably mounting a second mold section of each said set on said wheel plate in circumferentially spaced relation and radial alignment with each said one mold section and for movement radially toward and away from said one mold section,



the number of mold section slide assemblies corresponding to the number of sets of molds,

each said slide assembly being removably mounted on said wheel plate,

a second hub,

said first hub being removable and said second hub being adapted to be replaced on said shaft,

said second hub having a plurality of circumferentially spaced external surfaces for supporting mold sections,

the number of the external surfaces of the second hub differing from the number of external surfaces of the first hub,

said wheel plate having means for accommodating a different number of mold section slide assemblies to correspond with the different number of external surfaces on said second hub.

4,549,866

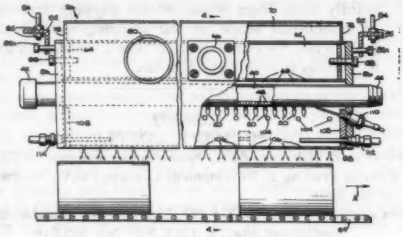
METHOD AND APPARATUS FOR APPLYING HEAT TO ARTICLES AND MATERIALS

Clive W. Granville, Yonkers, N.Y., assignor to Flynn Burner Corporation, New Rochelle, N.Y.

Filed May 8, 1984, Ser. No. 608,125
Int. Cl.⁴ F27D *5/00*; F24H *1/00*; F24J *3/00*
U.S. Cl. 432—10 **32 Claims**

1. A method of applying heat to a region, said method comprising the steps of producing a flame inside an enclosure formed by the walls of a hot gas discharge nozzle, directing a flow of process air into said enclosure to produce a positive pressure therein and to mix said process air inside said enclosure with the products of combustion from said flame and directing the hot gases of the resulting hot gas mixture out through spaced apart hot gas discharge openings in one wall of

said discharge nozzle to the region to be heated, the flame being produced by supplying a combustible mixture of fuel and



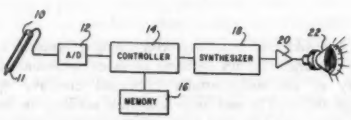
air to a burner at a pressure sufficient to maintain said flame against the positive pressure produced in said enclosure.

4,549,867

ELECTRONIC LEARNING AID WITH RANDOM NUMBER MODES

Ashok Dittakavi, Lubbock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 25, 1982, Ser. No. 382,008
Int. Cl.[4] G09B *17/00*
U.S. Cl. 434—337 **7 Claims**



1. An electronic learning aid comprising:

(a) a scanning means for selectively reading coded indicia, said coded indicia including first coded indicia corresponding to a random number generation command and a second coded indicia corresponding to a range command;

(b) a random number generating means connected to said scanning means for randomly selecting one of a specified set of numbers upon reading said coded indicia, the size of said set of numbers corresponding said range command;

(c) a response means connected to said random number generating means for selecting speech synthesis data corresponding to said selected number; and

(d) speech synthesis means connected to said response means for speaking one or more words of human language corresponding to said selected speech synthesis data.

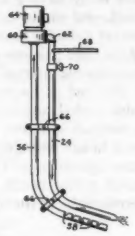
4,549,868

JET PROPULSION SYSTEM FOR BOATS

Richard W. Lolly, P.O. Box 33, Lolly Rd., Bokeelia, Fla. 33922

Filed Jul. 16, 1984, Ser. No. 631,441
Int. Cl.[4] B63H *11/00*
U.S. Cl. 440—42 **1 Claim**

1. A jet propulsion drive system for a boat floating in a body of wate that may be infested with hyacinths or other water plants, the boat having a bow, parallel water inlet and discharge pipes mounted on the bow of the boat, manually operable adjustable means to clamp the water inlet and discharge pipes at selected vertical elevations relative to the bow of the boat, a motor driven pump mounted on the inlet and discharge pipes, the water inlet pipe having rearwardly facing water inlet passages to be submered in the water to admit water into the inlet pipe without becoming clogged with hyacinths or other water plants, the water discharge pipe having an angularly inclined discharge opening to discharge water at an angle relative to the bow of the boat, and a manually operable lever



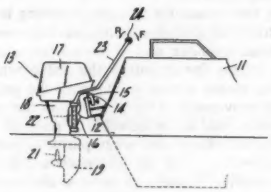
to oscillate the water inlet and discharge pipes about a vertical axis to exert a thrust in the water to steer the boat.

4,549,869

APPARATUS FOR OPERATING AN OUTBOARD MOTOR

Kazumi Iida, Iwata, and Kenji Ikeda, Hamamatsu, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata and Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, both of, Japan

Filed Mar. 10, 1983, Ser. No. 474,024
Claims priority, application Japan, Mar. 18, 1982, 57-41663
Int. Cl.[4] B60K *21/00*
U.S. Cl. 440—84 **4 Claims**



1. A control apparatus for an outboard motor or the like having a throttle and a forward/reverse transmission comprising a tiller carried by said motor for steering thereof and extending forwardly from said motor and an operating handle carried by said tiller and operatively connected to said throttle and to said transmission for controlling speed and shifting, the improvement comprising said operating handle being supported on said tiller about an axis extending at a right angle to said tiller for rotational movement relative to said tiller about said axis for rotational movement in a forward direction to effect engagement of a forward gear of the transmission and in a rearward direction to effect engagement of a reverse gear of the transmission and means for opening of the throttle regardless of which direction said operating handle is rotated upon continued rotation of the operating handle past the position wherein the respective gear of the transmission is engaged.

4,549,870

RAFT INFLATION VALVE

Lloyd G. Wass, 1670 Blackhawk Cove, Eagan, Minn. 55123

Filed Aug. 22, 1983, Ser. No. 525,234
Int. Cl.[4] B63C *9/24*
U.S. Cl. 441—41 **25 Claims**

25. A raft inflation system comprising:

an inflatable raft;

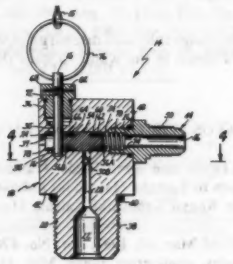
a pressure vessel for containing pressurized inflation gas for inflating the inflatable raft;

a normally closed raft inflation valve which is actuated to

permit flow of the pressurized inflation gas from the pressure vessel to the inflatable raft, the raft inflation valve comprising:

a valve body having an inlet connected to the pressure vessel, and outlet connected to the inflatable raft, an internal cylinder connected at a first end to the outlet, and an inlet passage which extends from the inlet and intersects the internal cylinder at a position intermediate the first end and a second end of the internal cylinder;

a double ended piston positioned for axial movement in the internal cylinder, the piston having first and second piston heads with ends of equal diameter, the first and second spaced apart O-ring seals carried by the first and second piston heads, respectively, and positioned on opposite sides of the intersection of the internal cylinder



and the inlet passage when the valve is in its normally closed condition;

spring bias means for applying a spring bias force to the piston in an axial direction toward the second end of the internal cylinder; and

firing means for actuating the valve when pulled, the firing means normally engaging the piston to prevent axial movement of the piston from the normally closed position, and being movable to position out of engagement with the piston when pulled to permit the spring bias force to move the piston toward the second end of the internal cylinder to uncover the intersection of the internal cylinder and the inlet passage and to permit gas flow from the inlet to the outlet to cause inflation of the raft.

4,549,871

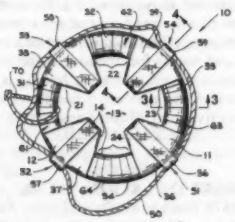
LIFESAVING RING

Darrel E. Verney, W. 3226 Litchfield Pl., Spokane, Wash. 99205

Filed Apr. 26, 1984, Ser. No. 604,018

Int. Cl.[4] B63C 9/10

U.S. Cl. 441—81 **9 Claims**



1. A hand held, throwable lifesaving ring, comprising:

a buoyant ring means having a continuous approximately circular outer circumference and at least one central aperture extending therethrough;

a plurality of distinct gripping sections and inter-grip sections positioned alternately about the circumference of the ring; the gripping sections being differently sized with respect to other gripping sections; the gripping and inter-grip sections being bounded along adjoining sides thereof by approximately radial abutting surfaces extending inwardly from inner edges of the gripping sections; the cross-sectional shape of the gripping sections having smooth exterior contours sized to be conveniently gripped by various sizes of human hands.

4,549,872

HOMOKINETIC COUPLING

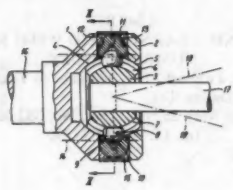
Zvonimir Z. Kumpar, Zeist, Netherlands, assignor to SKF Industrial Trading & Development Company B.V., Nieuwegein, Netherlands

Continuation of Ser. No. 374,293, May 3, 1982, abandoned. This application Mar. 5, 1984, Ser. No. 585,019

Claims priority, application Netherlands, May 14, 1981, 8102379

Int. Cl.[4] F16D 3/22

U.S. Cl. 464—141 **7 Claims**



1. A homokinetic coupling comprising a housing having a central axis and a cavity defining an inner spherical surface, a plurality of circumferentially arranged concave spherical openings disposed in said inner spherical surface, an inner ring having an outer spherical surface disposed in said cavity, a plurality of axially extending grooves of substantially constant depth circumferentially arranged in said outer spherical surface, each of said openings being situated radially outward of one of said grooves, a plurality of balls, each ball having a flattened edge with an opposite spherical outside surface, said balls being disposed with their flattened edge in the bottom of each of said grooves, each of the groove bottoms is correspondingly flattened to provide a bearing surface for said flattened edge, a plurality of rotatable ball-shaped elements, each disposed in one of said openings, each of said ball-shaped elements having a recess in which is situated part of said spherical outside surface of one of said balls.

4,549,873

ANGULARLY MOVABLE UNIVERSAL JOINT

Werner Krude, Siegburg-Kaldauen, Fed. Rep. of Germany, assignor to Uni-Cardan Aktiengesellschaft, Siegburg, Fed. Rep. of Germany

Continuation of Ser. No. 329,330, Dec. 10, 1981, abandoned. This application Mar. 27, 1984, Ser. No. 593,194

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1980, 3048339

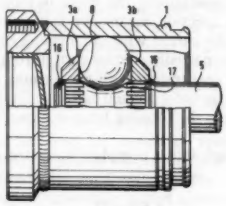
The portion of the term of this patent subsequent to Jan. 10, 2001, has been disclaimed.

Int. Cl.[4] F16D 3/24

U.S. Cl. 464—141 **1 Claim**

1. Angularly movable universal joint comprising an outer joint member having a central axis with an annular inner surface encircling the central axis and defining a hollow space therein, an inner joint member located within the hollow space in said outer joint member, said inner joint member having a central axis axially alignable with the central axis of said outer joint member, the inner surface of said outer joint member has uniformly circumferentially spaced axially extending grooves formed therein, said inner joint member has generally radially

extending openings therein opening outwardly therefrom toward said outer joint member, each said opening in said inner joint member is aligned opposite one of said grooves in said outer joint member, rolling members each arranged to fit into one of said openings in said inner joint member and extending radially outwardly therefrom into one of said grooves in said outer joint member for transmitting torque between said inner and outer joint members, said rolling members being spherically shaped with the spherically shaped surfaces of adjacent said rolling members being disposed in supporting contact with one another, an axially extending shaft, said inner joint member contains an axially extending bore and said shaft is positioned within said bore, wherein the improvement comprises that said inner joint member is an annular member having an inner surface forming said bore and an outer surface, said shaft is secured to the inner surface forming the bore in said inner joint member for rotation therewith, said inner joint member is



divided along a plane extending perpendicularly of the axis of said shaft into two similarly shaped inner joint member parts wherein the axial support of said inner joint member parts is provided by said shaft, said grooves have a circular shaped surface and said rolling members a correspondingly shaped surface so that said rolling members fit into said grooves, means for rigidly securing said inner joint member parts to said shaft for preventing axial movement of said inner joint member parts relative to said shaft, said inner joint member parts form, in combination, said openings and said openings have radially extending circular cylindrical sections with a diameter corresponding to the diameter of said rolling members with said rolling members fitted into said circular cylindrical sections, and said shaft having a circumferentially extending groove in the surface thereof defining the radially inner ends of said openings with said rolling members being in surface contact with said groove in said shaft and with said grooves in said outer joint member.

4,549,874

AUTOMATIC SPEED VARIATING MEANS FOR BICYCLE

Maz Wen, P.O. Box 10160, Taipei, Taiwan

Filed Jun. 6, 1983, Ser. No. 501,656
Int. Cl.⁴ B62M *1/08, 1/04, 23/00*
U.S. Cl. 474—69 **2 Claims**

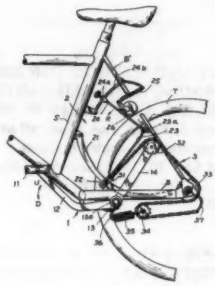
1. An automatic speed variating means for a bicycle comprising: an actuating means including a pedal, a pedal rod having a pivot pivotedly fixed in a bush fixed on a bottom fork of the bicycle and a driving rod extending from said pivot to form an angle with said pedal rod;

a speed adjusting means including an arcuate plate fixed between a seat tube and the bottom fork of a bicycle, a sliding block adjustably slidable along said arcuate plate, a controlling link centrally pivotedly fixed on an upper fork of a bicycle and lowerly connected with said sliding block and upperly formed with a handle, a first restoring spring means fixed to the upper fork of a bicycle to restore said speed adjusting means for normal bicycle running and a magnetic actuator fixed on said controlling link; and

a driving chain having its one end fixed on said sliding block and having the chain portion engaged with a first chain wheel rotatably fixed atop said driving rod, a second chain wheel formed on the center of a bicycle wheel, a third chain wheel which is connected at one end with a second restoring spring means fixed on said pivot by a bracket, and said chain having its other end fixed on the bottom fork adjacent said center of the bicycle wheel,

the improvement comprising:

said magnetic actuator having a rotor core and a stator collar, pivotedly fixed on the upper portion of said



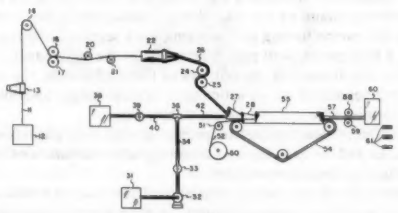
controlling link and pressed on the bicycle wheel by said first restoring spring means whereby said magnetic actuator operates by rotating said stator collar about said rotor core to urge said rotor core to rotate in the same direction as the faster rotating stator collar to thereby exert a torque biasing said controlling link to lower said sliding block along said arcuate plate and thereby increase the stroke of said driving chain for automatic speed variation.

4,549,875

MANUFACTURE OF TOBACCO SMOKE FILTERS

James W. Pryor, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Co., Winston-Salem, N.C.

Filed Jun. 2, 1983, Ser. No. 500,418
Int. Cl.⁴ B31C *13/00*
U.S. Cl. 493—49 **32 Claims**



1. Apparatus for manufacturing a filter rod containing a smoke-modifying agent comprising

(a) means for moving a continuous multi-filament filter tow through a succession of treatment steps with the direction of movement coinciding generally with the longitudinal axis of the filter tow,

(b) means for transforming the moving filter tow into a longitudinally oriented assemblage of filaments having individual filaments of the tow in substantial alignment,

(c) converging means for gathering and compressing the longitudinally oriented assemblage of filaments to produce a longitudinally oriented filter tow with a rope-like configuration,

(d) nozzle means associated with said converging means and

positioned in the path of the moving filter tow so that the nozzle means is substantially enveloped by the moving filter tow in encircling fashion,

(e) means for supplying controlled amounts of a smoke-modifying agent to the nozzle means for application of said agent to the moving filter tow, and

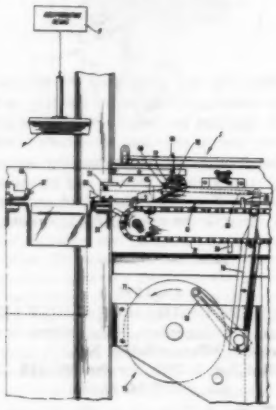
(f) rod-forming means adjacent to the converging means adapted to receive the longitudinally oriented, rope-like filter tow treated with said smoke-modifying agent and to form said filter tow into a filter rod having a predetermined shape.

4,549,876

APPARATUS AND METHOD FOR HIGH SPEED FORMING A HINGED CARTON

Thomas R. Baker, Los Altos; William H. Hittenberger, San Mateo, and Boris J. Posen, Los Altos, all of Calif., assignors to Kliklok Corporation, Greenwich, Conn.

Filed Sep. 30, 1982, Ser. No. 432,412
Int. Cl.⁴ B31B *3/60*
U.S. Cl. 493—169 **17 Claims**



1. Apparatus for forming a clamshell type carton from a free paperboard blank or the like along a substantially horizontal path, the carton having two sections, each section including at least a base panel, wall panels attached to the base panel, and corner tabs formed at the corners of the wall panels, the two sections separated by an articulated central hinge, and hinge tabs formed adjacent the hinge, comprising:

(a) a carton forming die for receiving said free paperboard blanks and for erecting and retaining selected panels of said carton by the adjacent tabs;

(b) means for conveying the paperboard blank along a substantially rectilinear guide path into contacting registration with the die;

(c) upstanding means for prebreaking and erecting said articulated hinge along said guide path during movement of said blank before said carton blank reaches the die, said prebreaking and erecting means being positioned upstream from the die adjacent said conveying means; and

(d) a hinge gathering guide along said guide path including hold down rails and downwardly facing hinge gathering groove means positioned to overlie and contact the central hinge of said free paperboard blank and urge the panels adjacent the central hinge fold line down against said upstanding means to thereby enable erection of the hinge without lifting the carton from the conveyor guide path; and

(e) a reciprocating forming head for forcing the erected hinged carton blank into said die immediately upon proper registration of the blank on said die so as to rapidly fold and erect said wall panels of said carton.

14. A method for forming a clam-shell type carton from a free paperboard blank or the like, the carton having two sections, each section including at least a base panel, wall panels attached to the base panel, and corner tabs formed at the corners of the wall panels, the two sections separated by an articulated hinge, and hinge tabs formed adjacent the hinge, comprising the steps of:

(a) conveying the free paperboard blank along a substantially rectilinear guide path in the direction of a forming die;

(b) erecting the carton hinge as the free blank is conveyed past upstanding erecting means toward the forming die;

(c) holding the carton down along the conveyor guide path during conveying and erecting by means of hold down rails and downwardly facing hinge gathering groove means overlying and contacting the carton hinge and urging the panels adjacent the articulated hinge down against said upstanding means thereby maintaining the hinge in longitudinal alignment with the erecting means for subsequent contacting registration of the carton with the forming die;

(d) transferring the partially erected carton from the conveyor into contacting registration with the forming die;

(e) supporting the partially erected carton in final position over the forming die in the forming head as a cantilevered structure; and

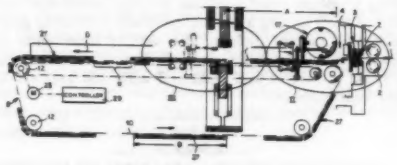
(f) forming the blank into a completely erected carton.

4,549,877

APPARATUS FOR MAKING BAGS OF THIN SYNTHETIC-RESIN FILM

Hans Lehmacher, Im Hummerich, 5216 Niederkassel-Mondorf, Fed. Rep. of Germany

Continuation of Ser. No. 265,547, May 20, 1981, Pat. No. 4,395,252. This application Jan. 17, 1983, Ser. No. 458,265
Claims priority, application Fed. Rep. of Germany, May 24, 1980, 3020009
The portion of the term of this patent subsequent to Jul. 26, 2000, has been disclaimed.
Int. Cl.⁴ B31B *23/14*
U.S. Cl. 493—204 **6 Claims**



1. An apparatus for making bags from an elongated tube of thin synthetic-resin film, said apparatus comprising:

an endless conveyor having a stretch defining a transport path extending in a transport direction from an upstream cutting/welding station through a stacking station and a flattening station, to a downstream punching station, said conveyor having an endless support element and a plurality of groups of transverse rigid bars forming along said path a plurality of respective platforms having predetermined lengths in said direction and spaced apart by gaps, the bars of each platform engaging one another in said direction;

means for feeding said tube generally continuously in said direction to said upstream cutting/welding station;

cutting/welding means in said cutting/welding station for periodically transversely cutting through said tube and generally simultaneously forming upstream of each cut a transversely throughgoing weld for subdividing said tube into a succession of bag blanks each having, as viewed in said transport direction, an unsealed upstream or trailing edge and a sealed downstream or leading edge;

stacking means in said stacking station including a transversely reciprocal needle bar provided with a plurality of needles adapted to engage said bag blanks and including at least one heated blocking needle, said needles being located downstream of and in close proximity to the cutting portion of said cutting/welding means, and a transversely reciprocal stripper bar through which said needles extend toward said path;

control means for synchronously operating said conveyor, said cutting/welding means, and said stacking means for (a) advancing said needles to pierce through the unsealed upstream edge region of each of said bag blanks as same is cut free from said tube, (b) intermittently immobilizing said conveyor to dispose a respective one of said platforms in a position just downstream of said cutting/welding station to enable that platform to support a plurality of said bag blanks in a stack as same are cut free from said tube, (c) after a predetermined number of operations of said cutting/welding means, stripping the accumulated stack of said bag blanks off said needles with said stripper bar, and (d) operating said conveyor to displace the stack of bag blanks stripped from said needles downstream along said transport path to said punching station;

flattening means in said flattening station having a plurality of flattening elements for engaging each of said bag blanks as same is cut free from said tube and pressing same flatly down against the platform supporting that bag blank and any others previously cut from said tube;

a gripper carriage displaceable in and against said direction and having a holding element displaceable vertically toward and away from said stretch, said control means being connected to said carriage to press said holding element down against each stack of bag blanks as same are stripped from said needle bar and for thereafter displacing said carriage synchronously and codirectionally with the platform supporting that stack downstream to said punching station; and

punching means at said punching station for punching a section out of said unsealed upstream edge region of each of said stacks of bag blanks as same arrive, said punching station being spaced in said direction downstream of said welding/cutting station by a distance substantially greater than said predetermined length of said platforms.

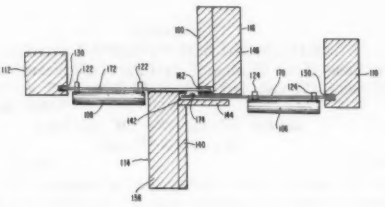
4,549,878

APPARATUS AND METHOD FOR ALIGNING AND JOINING INDIVIDUAL BLANKS

Melvin B. Herrin, 1156 Mill Rd. Cir., Meadowbrook, Pa. 19046, and Henry M. Chandler, Horsham, Pa., assignors to Melvin B. Herrin, Meadowbrook, Pa.

Filed Sep. 30, 1983, Ser. No. 537,655
Int. Cl.[4] B65C 9/08
U.S. Cl. 493—334 **16 Claims**

1. An apparatus for aligning and joining individual members together, said apparatus comprising supplying means for supplying upper and lower members to be joined together along a longitudinal joining area, at least one of said members including adhesive means provided on a surface portion thereof within said joining area, joining means for bringing said members together within said joining area, transporting means for transporting said members in spaced-apart relationship between said supplying means and said joining means, said transporting means including lower member end supporting means for supporting an inner end portion of said lower member, and upper member end supporting means for supporting an inner end portion of said upper member overlying said inner end portion of said lower member and said joining area, said lower and upper member end supporting means being constructed and arranged to provide a longitudinally extending opening between the opposing surfaces of said inner end portions of said lower and upper members so that at least said surface portion having said adhesive means thereon and the surface portion on the other member facing said adhesive means are exposed to each other, said opening cooperating with said



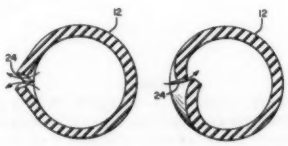
adhesive means provided on the surface of said inner end portion of one of said members so that said adhesive means is displaced from the opposing surface of said inner end portion of the other of said members within said joining area during the transporting of said lower and upper members toward said joining means to inhibit premature joining of said members, and to inhibit contact between said adhesive means and said lower and upper member end supporting means during transport to said joining means.

4,549,879

VALVED TWO-WAY CATHETER

LeRoy E. Groshong, and Ronald J. Brawn, both of Portland, Oreg., assignors to Catheter Technology Corporation, Salt Lake City, Utah

Filed May 3, 1983, Ser. No. 491,258
Int. Cl.[4] A61M 25/00
U.S. Cl. 604—247 **2 Claims**



1. A closed ended tubular catheter of silicon rubber of less than 100 durometer hardness, and a two-way valve in the side wall of said catheter, said valve consisting of a single, normally closed, linearly extending slit extending through the catheter wall, said slit having such length that when predetermined pressure differentials within and without the catheter exist, the catheter wall contiguous the slit deforms and causes the opposed faces of the slit to withdraw from one another and form a temporary orifice through which fluid may be infused or withdrawn the valve area and contiguous catheter wall having been treated with dimethylsiloxane so as to weaken and make more pliable the treated catheter wall in order to facilitate the two-way valve function.

4,549,880

SILICONE DURABLE PRESS TEXTILE TREATMENT PROCESS WITH RADIATION CURING AND RESULTING PRODUCT

James E. Hendrix, Spartanburg, S.C.; John Y. Daniels, Pineville, and Taryn M. White, Charlotte, both of N.C., assignors to Springs Industries, Inc., Fort Mill, S.C.

Filed Sep. 2, 1983, Ser. No. 529,042
Int. Cl.[4] D06M *13/10*
U.S. Cl. 8—115.52 6 Claims

1. A process of treating textile materials containing cellulosic fibers to provide durable press properties, said process comprising impregnating the material with a durable press finishing agent consisting essentially of a siloxane compound, drying the impregnated material, and irradiating the material with actinic radiation to react and crosslink the siloxane compound with the cellulosic fibers to impart said durable press properties to the fabric.

3. A process as set forth in claim **1** wherein said durable press finishing agent also includes a catalyst.

4,549,881

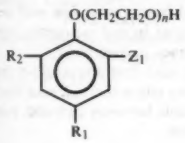
AQUEOUS SLURRY OF A SOLID FUEL AND A PROCESS AND MEANS FOR THE PRODUCTION THEREOF

Mait M. Mathiesen, Arild; Lars I. Gillberg, Lund; Karl M. E. Hellsten, ÖdsmÅl, and Gunvor B. T. Karlsson, Stenungsund, all of Sweden, assignors to Ab Carbogel, Helsingborg and Berol Kemi Ab, Stenungsund, both of, Sweden

Filed May 6, 1983, Ser. No. 492,197
Claims priority, application Sweden, May 7, 1982, 8202879
The portion of the term of this patent subsequent to Jan. 29, 2002, has been disclaimed.
Int. Cl.[4] C10L *1/32*
U.S. Cl. 44—51 17 Claims

1. An aqueous slurry of a solid fuel in the form of a pulverized, carbonaceous material and 0.02–2% by weight of surface active additives, the solids content of the slurry being 65–90% by weight, characterized in that said additives comprise, as a major part, (1) a water-soluble, nonionic surface active dispersing agent which is an alkylene oxide adduct having a hydrophobic part and a hydrophilic part, said hydrophilic part having at least one polyalkylene oxide chain with a length of 40–200 alkylene oxide units at least a part of which are ethylene oxide units and, as a minor part, (2) an ionic surface active agent in which the ionic charges of the ionic surface active agent are located at the hydrophobic moiety thereof.

3. A slurry as claimed in claim **1**, characterized in that the ionic surface active agent has the general formula



wherein R_1 and R_2 are hydrogen or an alkyl group with 1–22 carbon atoms, provided that the sum of the number of carbon atoms of R_1 and R_2 is at least 6, and Z_1 designates the group $-SO_3H$, $-CH_2{}^+NHR_3R_4X^-$ or $-CH_2{}^+NR_3R_4R_5X^-$, wherein R_3, R_4 and R_5 are alkyl and/or hydroxyalkyl groups with 1–4 carbon atoms and X is an anion, and n is 40–200.

4,549,882

CORROSION INHIBITORS FOR ALCOHOL CONTAINING FUELS

Gordon G. Knapp, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Oct. 19, 1984, Ser. No. 662,777
Int. Cl.[4] C10L *1/22*
U.S. Cl. 44—53 22 Claims

1. A liquid fuel adapted for use in an internal combustion engine said fuel comprising from 5 to 100 weight percent of one or more alcohols, from 0 to 95 weight percent gasoline and a corrosion inhibiting amount of the combination of (A) at least one monoalkenylsuccinic acid wherein the alkenyl group contains about 8 to 30 carbon atoms, and (B) an N-(2-hydroxyalkyl)monoalkanolamine or an N-(2-hydroxyalkyl)dialkanolamine.

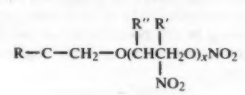
4,549,883

CETANE IMPROVER FOR DIESEL FUEL

Robert F. Purcell, 605 Bryce Trail, Roselle, Ill. 60172, and Louis L. Hallock, Rte. No. 3, Miller Rd., P.O. Box 271, Lake Zurich, Ill. 60047

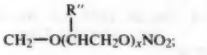
Filed Dec. 19, 1983, Ser. No. 563,124
Int. Cl.[4] C10L *1/22*
U.S. Cl. 44—57 6 Claims

1. A fuel composition comprising a major amount of a hydrocarbon-based fuel and a small amount of at least one nitrate ester having the formula:



where

R is H, CH_3 or



R′ is H, CH_3 or C_2H_5;

R″ is H Or C_{1-3} alkyl; and

x is 1 or 2

where said nitrate ester is present in an amount sufficient to produce an improvement in the cetane rating of said hydrocarbon-based fuel.

4,549,884

DIESEL OIL CONTAINING MONOALKOXYLATED NONYL PHENOL CHARACTERIZED BY DECREASE IN VISIBLE SMOKE IN EXHAUST GASES

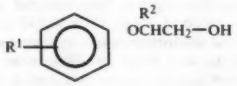
Antonio M. Mourao, Fishkill, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed May 1, 1984, Ser. No. 606,083
Int. Cl.[4] C10L *1/18*
U.S. Cl. 44—57 22 Claims

1. A liquid middle distillate fuel composition comprising

(i) a major portion of a liquid middle distillate hydrocarbon fuel; and

(ii) a visible-smoke reducing portion of additive having the formula



wherein

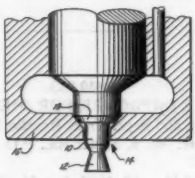
R^1 is an alkyl, aralkyl, alkaryl, cycloalkyl, alkenyl, or alkynyl hydrocarbon group; and

R^2 is hydrogen or an alkyl, aralkyl, alkaryl, cycloalkyl, alkenyl, or alkynyl hydrocarbon group.

4,549,885
FUEL COMPOSITIONS

Gordon G. Knapp, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Oct. 30, 1984, Ser. No. 666,373
Int. Cl.[4] C10L *1/22*
U.S. Cl. 44—57 20 Claims



1. Distillate fuel for indirect injection compression ignition engines containing at least the combination of (a) organic nitrate ignition accelerator, and (b) an N-(2-hydroxyalkyl)-monoalkanolamine or an N-(2-hydroxyalkyl)dialkanolamine, said combination being present in an amount sufficient to minimize the coking characteristics of such fuel, especially throttling nozzle coking in the prechamber or swirl chambers of indirect injection compression ignition engines operated on such fuel.

4,549,886
OPERATION OF GAS GENERATOR

John S. Stevenson, Los Angeles, Calif., assignor to Texaco Inc., White Plains, N.Y.

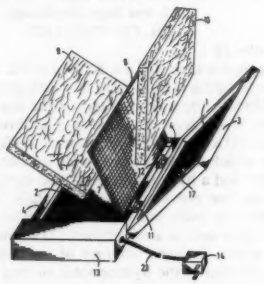
Filed Mar. 30, 1984, Ser. No. 595,101
Int. Cl.[4] C10J *3/46*
U.S. Cl. 48—197 R 28 Claims

1. In a partial oxidation process for the production of a raw effluent stream of synthesis gas, reducing gas, or fuel gas in a free-flow partial, oxidation gas generator wherein a plurality of feedstreams comprising a liquid hydrocarbonaceous fuel optionally in admixture with a temperature moderator, or a slurry of solid carbonaceous fuel, at least one feedstream comprising a free-oxygen containing gas optionally in admixture with a temperature moderator, and with or without a separate feedstream of temperature moderator are passed through feed lines provided with flow control means and then through a multipassage burner which discharges into the reaction zone of said free-flow partial oxidation gas generator; the improvement for adjusting the flow rates for the separate feedstreams to the burner a predetermined amount to turn-down or turn-up the output of said raw effluent gas stream comprising: adjusting the flow rate down at turn-down or up at turn-up a predetermined amount for the fuel feedstream optionally in admixture with a temperature moderator, the separate stream of temperature moderator, if any, and at least one feedstream of free-oxygen containing gas optionally in admixture with a temperature moderator to obtain a decreased output of effluent gas at turn-down or an increased output of effluent gas at turn-up while maintaining the O/C atomic ratio and the temperature moderator/fuel weight ratio in the reaction zone substantially constant; adjusting the temperature of at least one feedstream of free-oxygen containing gas optionally in admixture with a temperature moderator to a predetermined value which is an indirect function of its adjusted flow rate and which is within the temperature range of about 32° F.–1500° F.; wherein the flow rate adjusting comprises reducing at turn-down or alternatively increasing at turn-up the flow rates for the feedstreams simultaneously or in sequence and at turn-down the flow rate reduction for at least one feedstream of free-oxygen containing gas optionally in admixture with a temperature moderator being started first followed by the reduction of the flow rate for the fuel stream optionally in admixture with a temperature moderator, and the flow rate for the temperature moderator stream if any; or where alternatively at turn-up the flow rate adjusting comprises increasing the flow rates of the feedstreams in sequence to predetermined levels by first starting to increase the flow rate of the fuel stream optionally in admixture with a temperature moderator, and the flow rate for the temperature moderator stream if any, and then raising the flow rate of feedstream of free-oxygen containing gas optionally in admixture with a temperature moderator; wherein said flow rates changes are carried out so that the O/C atomic ratio for the feeds is decreased by up to 0.05 during the transient period, and the temperature of at least one feedstream of free-oxygen containing gas optionally in admixture with a temperature moderator is increased to a predetermined value when the flow rate is reduced and decreased to a predetermined value when the flow rate is increased; and wherein the change in burner tip velocity remains within an acceptable range for each feedstream of temperature adjusted free-oxygen containing gas optionally in admixture with a temperature moderator and/or any mixed stream comprising fuel, temperature moderator, and temperature adjusted free-oxygen containing gas so that the carbon conversion to gas varies by less than ±4.0 weight %.

4,549,887
ELECTRONIC AIR FILTER

Constantinos J. Joannou, 2008 Dorval Ave., Ottawa, Ontario, Canada (K1G 2N8)

Filed Jan. 10, 1983, Ser. No. 456,853
Int. Cl.[4] B03C *3/09*
U.S. Cl. 55—131 6 Claims

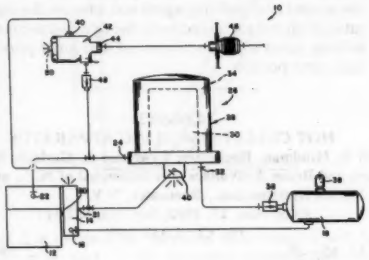


1. An electronic filter, comprising:
first and second outside metallic screens;
first and second outside metal frames, said first and second outside screens being mounted in and supported by said first and second outside frames, respectively;
first hinge means connecting said first and second frames together along corresponding edges thereof, said first and second screens being moveable between a closed, parallel position and an open position;
an inside metallic screen;
an inside frame, constructed of electrically insulating material, said inside screen being mounted in and supported by said inside frame;
second hinge means pivotally mounting said inside frame to one of said outside frames, said inside screen being between and parallel to said outside screens when said outside screens are in said closed position, said inside screen being electrically insulated from said outside screens;
a high voltage power supply unit secured to one of said outside frames, said high voltage power supply being electrically connected across said inside and outside screens; and
first and second removable fibrous pads positionable between said inside screen and said first and second outside screens, respectively, said pads being removable when said outside screens are in said open position.

4,549,888
AUTOMATIC CONTROL FOR AN EXTERNAL AIR SUPPLY

Richard C. Fannin, Grafton, Ohio, assignor to Allied Corporation, Morristown, N.J.

Filed Nov. 7, 1984, Ser. No. 669,158
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—163 **8 Claims**

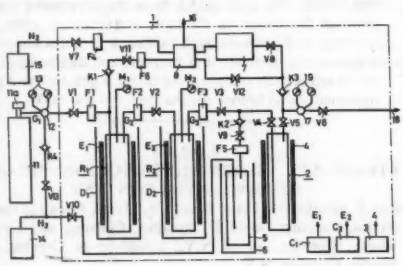


1. Vehicle air brake system including an air compressor for compressing air, a storage reservoir communicated with the air compressor for storing air compressed by the air compressor, a governor communicated with the reservoir for generating a governing pressure signal to unload said compressor when the pressure level in the storage, reservoir attains a predetermined level, and means for communicating said air brake system to an auxiliary air supply located off of said vehicle to maintain pressure in said storage reservoir when the vehicle is parked, said communicating means including a releasable coupling for connecting with said auxiliary air supply, and control valve means for controlling communication between said coupling and said reservoir and having a supply port communicated with said coupling, a delivery port communicating with said storage reservoir, and a eontrol port communicated with said governing pressure signal to control communication between the supply and delivery ports in response to said governing pressure signal.

4,549,889
REFINING PROCESS OF REACTIVE GAS FOR FORMING SEMICONDUCTOR LAYER

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Tokyo, Japan

Filed May 31, 1983, Ser. No. 499,271
Claims priority, application Japan, May 31, 1982, 57-92611
Int. Cl.[4] F25J *3/00*
U.S. Cl. 62—11 **14 Claims**



1. A refining process for refining an impure reactive gas for use in the formation of a layer, said impure reactive gas containing at least oxygen in an amount sufficient to interfere with the formation of the layer, the process comprising:

(a) providing at least one liquefying and gasifying recepticle and a storage container;

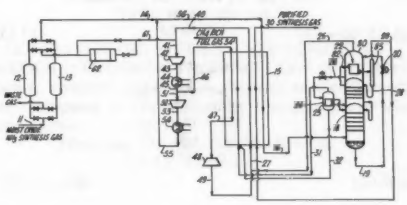
(b) introducing the impure reactive gas to be refined into the said recpetacle and liquefying said impure reactive gas therein to form a liquefied reactive gas, and then gasifying said liquefied reactive gas in said receptacle to form a gasified reactive gas; and then

(c) introducing the gasified reactive gas from said receptacle as a product gas having an oxygen concentration sufficiently small to preclude formation of oxygen clusters or oxides in the layer, into said storage container for storage therein for use in the formation of the layer.

4,549,890
PROCESS AND PLANT FOR REMOVING METHANE AND ARGON FROM CRUDE AMMONIA SYNTHESIS GAS

Bernard R. Bligh, Hampton Hill, England, assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 1, 1983, Ser. No. 557,083
Claims priority, application United Kingdom, Dec. 23, 1982, 8236616; Apr. 28, 1983, 8311579
Int. Cl.[4] F25J *3/02*
U.S. Cl. 62—18 **10 Claims**



1. A process for removing methane and argon from crude ammonia synthesis gas, which method comprises the steps of:

(a) providing a crude ammonia synthesis gas having 26–31 volume percent nitrogen;

(b) cooling said crude ammonia synthesis gas in a heat exchanger;

(c) distilling the cooled crude ammonia synthesis gas to provide purified ammonia synthesis gas and a liquid fraction containing methane, argon and nitrogen;

(d) expanding said liquid fraction containing methane, argon and nitrogen;

(e) introducing at least part of the liquid from step (d) into indirect heat exchange with vapor from the top of said distillation column to condense part of said vapor and provide reflux for said distillation column whilst simultaneously separating said liquid into a liquid stream rich in methane, and a gaseous stream rich in nitrogen;

(f) warming said gaseous stream from step (e);

(g) compressing at least part of the warmed gaseous stream from step (f);

(h) cooling at least part of the compressed gaseous stream from step (g);

(i) expanding at least part of the cooled gaseous stream from step (h); and

(j) passing the expanded gaseous stream from step (i) through said heat exchanger.

9. A plant comprising means designed for removing methane and argon from crude ammonia synthesis gas having 26–31 volume percent nitrogen, which plant including:

(a) a heat exchanger for cooling crude ammonia synthesis gas;

(b) a distillation column for distilling the cooled crude ammonia synthesis gas to provide, in use, purified ammonia synthesis gas and a liquid fraction containing methane, argon and nitrogen;

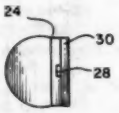
(c) means for expanding said liquid fraction containing methane, argon and nitrogen;
(d) means for, in use, conveying at least part of the liquid from step (c) into indirect heat exchange with vapour from the top of said distillation column to condense part of said vapour and provide reflux for said distillation column whilst simultaneously separating said liquid into a liquid stream rich in methane, and a gaseous stream rich in nitrogen;
(e) means to warm, in use, at least part of the gaseous stream from step (d);
(f) a compressor to compress, in use, the warmed gaseous stream from means (e);
(g) means to cool, in use, at least part of the compressed gaseous stream from said compressor;
(h) an expander for expanding, in use, at least part of the cooled compressed gaseous stream from means (g); and
(i) a pipe for carrying expanded gas from said expander to said heat exchanger.

4,549,891

METHOD FOR FORMING A NON-SYMMETRICAL OPTICAL FIBER

William T. Plummer, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Feb. 23, 1984, Ser. No. 582,914
Int. Cl.⁴ C03B *37/01*
U.S. Cl. 65—3.12 **11 Claims**



1. A method for forming an optical fiber preform for drawing to an optical fiber, said method comprising the steps of:
forming an elongated support blank;
applying a first layer of glasseous material to at least a portion of a given surface of said blank as an unsintered, soot glass layer which (1) is sinterable to a hard glass layer of given index of refraction suitable as a cladding layer and (2) is easily machineable as compared to its sintered form;
machining a groove in said unsintered layer;
depositing glasseous soot material within said groove and ultimately providing a core strip of hard glass material having an index of refraction higher than that of said first layer;
applying a second layer of glasseous material over said first layer and said core stripe to provide a cladding layer of hard glass material having an index of refraction lower than that of said core stripe; and
heating the structure at one or more stages following the step of machining said groove to sinter said first layer to a hard glass layer, to provide an optical preform.

4,549,892

PROCESS FOR PRODUCING HOLLOW, BILAYERED SILICATE MICROSPHERES

Alfred G. Baker, and Andrew J. Baker, both of 41 Myrtle St., Glen Waverley, Victoria 3150, Australia

PCT No. PCT/AU82/00160, § 371 Date May 23, 1983, § 102(e) Date May 23, 1983, PCT Pub. No. WO83/01068, PCT Pub. Date Mar. 31, 1983
PCT Filed Sep. 22, 1982, Ser. No. 506,649
Int. Cl.⁴ B32B *5/16*; C03B *19/10*
U.S. Cl. 65—21.4 **17 Claims**

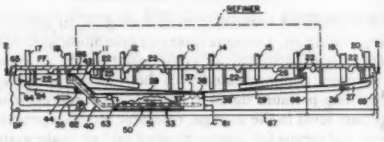
1. A process for producing hollow microspheres comprising
(a) mixing together an aqueous solution (i) containing a silicate and an aqueous solution (ii) containing a first insolubilizing agent to form a feedstock,
(b) forming the feedstock into droplets
(c) spray drying the droplets to form hollow microspheres, and
(d) applying to the droplets during the spray drying, an aqueous solution (iii) of a second insolubilizing agent to produce hollow microspheres the inner portion of the shell of which comprises the reaction product of the silicate and the first insolubilizing agent, the outer portion of which comprises the reaction product of the silicate and the second insolubilizing agent and wherein the equivalent ratio of silicate to, respectively the first and second insolubilizing agent is less in respect of said inner portion than said outer portion.

4,549,893

HOT CULLET HANDLING APPARATUS

David B. Hindman, Rochester; Lawrence L. Gerlach, Spencerport, and Bruce A. Wallace, Rochester, all of N.Y., assignors to French Systems, Inc., Rochester, N.Y.

Filed Nov. 17, 1983, Ser. No. 552,617
Int. Cl.⁴ C03B *7/00*
U.S. Cl. 65—28 **4 Claims**



1. A method of disposing of hot gobs of glass which are discharged downwardly in spaced reject chutes from the forming floor of a glass factory to another floor therebeneath, comprising
positioning a quenching tank on said other floor in laterally offset relation to at least certain of the lower, discharge ends of said chutes,
connecting the lower, discharge ends of said chutes to said quenching tank adjacent one end thereof by means of a series of open, generally trough-shaped sluices the open sides of which register with the lower ends of said chutes to receive hot gobs of glass from said chutes, opposite ends of said sluices being positioned one sightly above the other so that each sluice is inclined to the vertical,
supplying cooling water to said tank to maintain the cooling water at a predetermined level in said tank,
continuously recirculating cooling water from said tank to the upper ends of said sluices instantly to quench the hot gobs upon discharge thereof from said chutes to said sluices, and thereby to form around the outside of each gob a thin shelf, which causes each gob to retain its shape and enables the quenched gobs to be conveyed by gravity through the sluices to the tank, and
conveying said gobs through said tank to a discharge point adjacent the opposite end thereof, and at a rate which is set to reduce the temperature of each gob below a predetermined value before discharge from the tank.

4,549,894

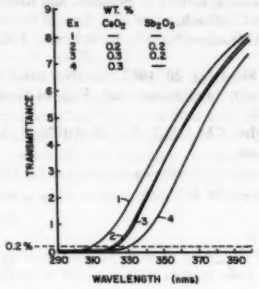
ULTRAVIOLET ABSORBING PHOTOCHROMIC GLASS OF LOW SILVER CONTENT

Roger J. Araujo, Big Flats; George B. Hares, Corning; David J. Kerko, Corning; David W. Morgan, Corning, and David L. Morse, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jun. 6, 1984, Ser. No. 617,908
Int. Cl.⁴ C03C *3/26*
U.S. Cl. 65—30.11 **4 Claims**

1. A method for producing a photochromic glass article that, in cross section of <2 mm but >1.3 mm, will transmit less than

0.2% of radiations having wavelengths between 290–315 nm, can be chemically strengthened to pass the strength standards mandated by the FDA, and at 20°–25° C. will exhibit a darkened luminous transmittance below 35% and a fading rate such



that after five minutes the luminous transmittance will be at least 1.75 times that of the darkened transmittance, which method comprises the steps of:

(a) melting a batch for a glass consisting essentially, expressed in terms of weight percent on the oxide basis, of

SiO_2	55–61	CeO_2	0.1–1
B_2O_3	18–21	Ag	>0.1–<0.2
Al_2O_3	5–11	CuO	0.003–0.015
Li_2O	1.5–3	Cl	0.2–0.6
Na_2O	2–5	Br	0.05–0.2
K_2O	4.5–8	Sb_2O_3 and/or As_2O_3	0.1–1.5

wherein the amount of Sb_2O_3 and/or As_2O_3 is at least 75% of the amount of CeO_2 present;

(b) cooling said melt and simultaneously forming a glass article of a desired geometry therefrom; and thereafter

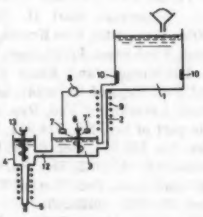
(c) heating said glass article to a temperature between about 650°–675° C. for a sufficient period of time to cause the growth of silver halide crystallites therein whereby said photochromic glass article is provided which, at 20°–25° C., will exhibit a darkened luminous transmittance below 35% and a fading rate such that after five minutes the luminous transmittance will be at least 1.75 times that of the darkened transmittance.

4,549,895

METHOD AND APPARATUS FOR MELTING GLASS

Tetsuro Izumitani, Tokyo; Toshi Takajoh, Saitama, and Iwao Kinjo, Tokyo, all of Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Aug. 31, 1982, Ser. No. 413,318
Claims priority, application Japan, Sep. 3, 1981, 56-137713; Sep. 3, 1981, 56-137712
Int. Cl.[4] C03B 5/04
U.S. Cl. 65—134 **4 Claims**



1. A method of melting glass utilizing a glass melting system comprised of a melting tank a refining tank and a working tank in which the volume of the melting tank is five to ten times larger than the volume of the refining tank and the working tank, comprising melting a single batch of raw material in the melting tank to obtain molten glass having a uniform refractive index, intermittently feeding the molten glass to the refining tank until the melting tank is substantially empty, continuously treating the molten glass supplied to the refining tank and continuously supplying the treated molten glass to the working tank.

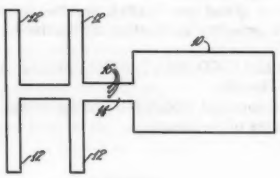
4. An apparatus for melting glass comprising melting tank means, a refining tank and a working tank, pipe means for intermittently supplying molten glass from said melting tank means to said refining tank and means for continuously supplying molten glass from said refining tank to said working tank, wherein said melting tank means is comprised of a plurality of individual melting tanks each of which is provided with said pipe means and means for selectively moving each of said melting tanks into a discharge position relative to said refining tank for transferring molten glass from a respective tank through its connecting pipe means into said refining tank.

4,549,896

APPARATUS AND METHOD FOR REMOVING GASEOUS INCLUSIONS FROM MOLTEN MATERIAL

William L. Streicher, and Mark A. Propster, both of Granville, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 27, 1984, Ser. No. 644,476
Int. Cl.[4] C03B 5/16
U.S. Cl. 65—135 **12 Claims**



1. A method for melting heat-softenable material in a melting furnace having a tank, said method including the steps of:

forming a pool of molten material in the tank;

heating the pool of molten material;

flowing the molten material away from the tank through a restricted zone to discharge molten material from the tank; and

applying vibrations to the molten material in the restricted zone to induce migration and coalescence of any inclusions until the amount of inclusions in the restricted zone has been reduced to a desired level.

8. A furnace for electrically melting heat-softenable material, said furnace comprising:

a tank for holding molten material formed by a bottom, side walls and walls of refractory;

means for supplying batch material over the molten material in the tank;

means for electrically supplying heat to the molten material in the tank;

a channel for flowing molten material away from the tank, said channel extending beyond an end wall thereof; and

means for applying sonic energy to the molten material in the channel, said sonic means extending into the molten material contained in the channel.

4,549,897

PROTEIN DEGRADED PRE-VULCANIZED NATURAL RUBBER COATED SLOW RELEASE FERTILIZERS

Yeoh C. Seng, and Chen S. Fong, both of Kuala Lumpur, Malaysia, assignors to Petroliam Nasional Berhad, Kuala Lumpur, Malaysia

Filed Aug. 17, 1982, Ser. No. 408,774

Claims priority, application United Kingdom, Aug. 20, 1981, 8125458

Int. Cl.[4] A01N *25/26*

U.S. Cl. 71—3 9 Claims

1. The slow release fertilizer composition which comprises particles of a fertilizer coated with a layer of protein degraded pre-vulcanized natural rubber.

4,549,898

N-HETEROCYCLOSULFONYL-N'-PYRIMIDINYLUREAS AND N-HETEROCYCLOSULFONYL-N'-TRIAZINYLUREAS

Beat Böhner, Binningen; Werner Föry, Basel; Karl Gass, Magden, and Willy Meyer, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

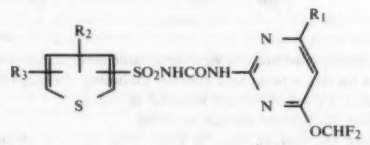
Filed Jun. 6, 1983, Ser. No. 501,459

Claims priority, application Switzerland, Jun. 14, 1982, 3671/82

Int. Cl.[4] C07D *409/12, 407/12, 401/12;* A01N *47/36*

U.S. Cl. 71—90 17 Claims

1. A compound selected from the group consisting of a sulfonylurea of the formula:



wherein

R_1 is halo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, haloalkyl of 1 to 4 carbon atoms, haloalkoxy of 1 to 4 carbon atoms, or dialkylamino, each alkyl of which has from 1 to 4 carbon atoms;

R_2 is hydrogen, halo, alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms, alkylsulfonyl of 1 to 3 carbon atoms, N,N-dialkylaminosulfonyl each alkyl of which has from 1 to 3 carbon atoms, alkanoyl of 1 to 4 carbon atoms, alkoxycarbonyl of 1 to 4 carbon atoms, allyloxycarbonyl, 2-methoxyethoxycarbonyl or propargyloxycarbonyl; and

R_3 is hydrogen, halo, alkyl of 1 to 3 carbon atoms, methoxy, nitro or trifluoromethyl; and the salts thereof.

7. A compound according to claim 6 wherein R_3 is hydrogen and R_2 is hydrogen, fluoro, chloro, alkoxy of 1 to 3 carbon atoms, acetyl, nitro, methylsulfonyl, allyloxycarbonyl, 2-methoxyethoxycarbonyl, propargyloxycarbonyl, dimethylaminosulfonyl, or alkoxycarbonyl of 1 to 4 carbon atoms.

4,549,899

HERICIDALLY ACTIVE NOVEL SUBSTITUTED 3-TRIHALOGENOMETHYL-1,2,4-THIADIAZOL-5-YL-OXYACETAMIDES

Heinz Förster, Wuppertal; Erich Klauke, Odenthal; Ludwig Eue, Leverkusen; Robert R. Schmidt, and Klaus Lürssen, both of Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

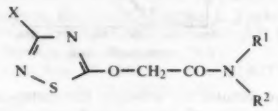
Filed Jul. 20, 1983, Ser. No. 516,177

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1982, 3228147

Int. Cl.[4] C07D *285/08;* A01N *43/82*

U.S. Cl. 71—90 8 Claims

1. A substituted 3-trihalogenomethyl-1,2,4-thiadiazol-5-yl-oxyacetamide of the formula



in which

X represents $-CFCl_2$, $-CF_2Cl$ or $-CF_3$ and

R^1 and R^2, which can be identical or different, individually represent alkyl, cyanoalkyl, alkoxyalkyl, alkylthioalkyl, alkenyl, alkinyl or alkoxy, each having up to 10 C atoms, cycloalkyl or cycloalkenyl, each having up to 12 C atoms, aralkyl which has 1 or 2 carbon atoms in the alkyl part and 6 or 10 carbon atoms in the aryl part, which is optionally substituted by halogen, or represent aryl having 6 or 10 carbon atoms, it being possible for the aryl radical to be substituted by 1 to 3 halogen atoms, 1 to 3 alkyl groups, each being optionally substituted by halogen and having 1 to 4 carbon atoms, nitro, cyano or alkoxy having 1 to 4 carbon atoms,

or wherein the radicals R^1 and R^2, together with the nitrogen atom to which they are bonded, form an unsaturated and/or benzofused monocyclic or bicyclic structure which has up to 15 carbon atoms as the only other ring atoms and is optionally substituted by 1 to 3 alkyl groups, each having 1 to 5 carbon atoms, or by two geminal alkoxy groups, each having 1 to 3 carbon atoms,

or wherein the radicals R^1 and R^2, together with the nitrogen atom to which they are bonded, form a saturated monocyclic structure which has up to 6 carbon atoms, is optionally substituted by 1 to 3 alkyl groups, each having 1 to 5 carbon atoms, and optionally contains a further nitrogen atom, oxygen atom or sulphur atom in the ring.

4,549,900

COMBATING FUNGI WITH SUBSTITUTED 1-AZOLYL-BUTAN-2-ONES AND -2-OLS

Wolfgang Krämer, Wuppertal; Karl H. Büchel, Burscheid; Hans-Ludwig Elbe, Wuppertal; Udo Kraatz, Leverkusen; Erik Regel, Wuppertal; Paul-Ernst Frohberger, Leverkusen; Wilhelm Brandes, Leichlingen, and Klaus Lürssen, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

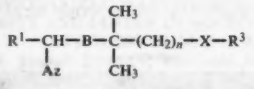
Continuation-in-part of Ser. No. 324,911, Nov. 26, 1981, abandoned, and Ser. No. 328,871, Dec. 8, 1981, abandoned. This application Apr. 4, 1983, Ser. No. 481,615

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1980, 3048266; Dec. 20, 1980, 3048267

Int. Cl.[4] A01N *43/50, 43/64;* C07D *233/60, 249/08*

U.S. Cl. 71—92 18 Claims

1. A substituted 1-azolyl-butan-2-one or -ol of the formula



in which

B is —CO— or —CH(OH)—,

Az is a 1,2,4-triazol-1-yl or -4-yl or imidazol-1-yl radical,

R^1 is a hydrogen atom, an alkyl radical with 1 to 6 carbon atoms, an alkenyl or alkinyl radical with in each case 2 to 6 carbon atoms, a cyclohexyl or cyclohexylmethyl radical which is optionally substituted by methyl, or an optionally substituted phenoxyalkyl or optionally substituted phenylalkyl radical with in each case 1 or 2 carbon atoms in the alkyl part,

n is 0 or 1,

X is an oxygen or sulphur atom or an SO or SO_2 group, and

R^3 is an alkyl or halogenalkyl radical with 1 to 4 carbon atoms or an optionally substituted phenyl or benzyl radical, or

an acid addition salt or metal salt complex thereof, wherein when present the optional substituents of the phenyl moiety of the phenoxyalkyl or phenylalkyl radical of R^1 and of the phenyl moiety of the phenyl or benzyl radical of R^3 are selected from fluorine, chlorine, bromine, methyl, ethyl, isopropyl, tert.-butyl, dimethylamino, methoxy, methylthio, cyclohexyl, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, nitro, cyano, phenyl, phenoxy, fluorophenyl, chlorophenyl, chlorophenoxy, fluorophenoxy, and the group —CO—NR^7R^8, in which R^7 and R^8 each independently is hydrogen, alkyl with 1 to 4 carbon atoms, optionally halogen- and C_1 to C_4 alkyl-substituted phenyl, or R^7 and R^8 both together with the adjacent nitrogen atom form a morpholine ring.

14. A fungicidal or plant growth regulating composition comprising a fungicidally or plant growth regulating effective amount of a compound, salt or complex according to claim **1** in admixture with a diluent.

4,549,901

2-[4-(SUBSTITUTED ARYL)PHENOXY]-N-SUBSTITUTED-PHENYLSULFONYL PROPIONAMIDES HAVING HERBICIDAL PROPERTIES

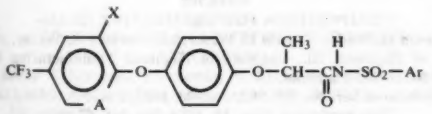
Donald R. James, El Sobrante, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Feb. 16, 1984, Ser. No. 580,583

Int. Cl.[4] **C07D** *213/64;* **C07C** *103/76;* **A01N** *43/40, 37/28*

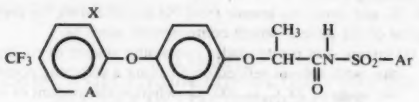
U.S. Cl. 71—94 **23 Claims**

1. As new compounds, 2-[4-[(substituted aryloxy)phenoxy]-N-substituted phenylsulfonyl]propionamides having the formula



wherein A is CH, or nitrogen, X is hydrogen or chlorine and Ar is phenyl or methyl, chloro, carboxy substituted phenyl.

15. A method for controlling undesirable weed pests which comprises applying to the locus where control is desired a herbicidally effective amount of a compound having the formula



wherein A is CH, or nitrogen, X and Y is hydrogen or chlorine and Ar is phenyl or methyl, chloro or carboxy substituted phenyl.

4,549,902

SALTS OF DERIVATIVES OF N-(TETRAHYDROBENZOTHIAZOLYLCARBAMOYL-)OXAMIC ACID AND HERBICIDAL COMPOSITION CONTAINING THE SAME AS ACTIVE INGREDIENT

Katsumichi Aoki; Takafumi Shida; Hideo Arabori; Satoru Kumazawa; Susumu Shimizu; Takeo Watanabe; Yohichi Kanda; Keigo Satake; Shiro Yamazaki; Hiroyasu Shinkawa, and Tsuneaki Chida, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

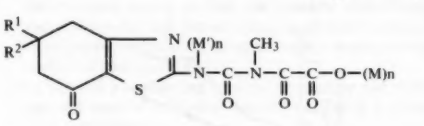
Filed Apr. 6, 1984, Ser. No. 597,269

Claims priority, application Japan, Apr. 8, 1983, 58-61928

Int. Cl.[4] **C07D** *277/82;* **A01N** *47/36*

U.S. Cl. 71—90 **12 Claims**

1. A salt of a derivative of N-(tetrahydrobenzothiazolylcarbamoyl)oxamic acid, represented by the formula:



(I)

wherein R^1 represents a straight-chain alkyl group having one to six carbon atoms, branched-chain alkyl group having up to and including six carbon atoms, cyclic alkyl group having up to and including six carbon atoms or a phenyl group; R^2 represents a hydrogen atom or a methyl group; M is an alkali metal atom or an alkaline earth metal atom; n is 1 when M is an alkali metal atom or n is ½ when M is an alkaline earth metal atom and M′ is a hydrogen atom or the same as M.

4,549,903

HERBICIDAL COMPOSITIONS OF ACIFLUORFEN OR SALTS THEREOF AND CITRATES

Norman R. Gerhold, Warrington, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 3, 1983, Ser. No. 538,312

Int. Cl.[4] **A01N** *37/38*

U.S. Cl. 71—116 **18 Claims**

1. A herbicidal composition comprising (a) a herbicide selected from the group consisting of acifluorfen and an agronomically acceptable salt thereof and (b) a citrate selected from the group consisting of alkali metal, alkaline earth metal and ammonium citrates wherein the citrate is present in a greater weight amount than the herbicide.

4,549,904

PROCESS FOR THE PREPARATION OF PELLETS

Saburo Matsumiya, Chiba; Katsuya Uehara; Keiji Saito, both of Mobara; Hideyuki Michiki, and Kenichi Yaginuma, both of Chiba, all of Japan, assignors to Toyo Engineering Corporation, Tokyo, Japan

Filed Jun. 7, 1982, Ser. No. 385,362

Claims priority, application Japan, Jun. 26, 1981, 56-99237

Int. Cl.[4] **C22B** *1/24*

U.S. Cl. 75—7 **12 Claims**

1. A process for preparing pellets from iron pyrite cinder

containing arsenic as an impurity in an amount of at least 0.1 wt. %, and removing arsenic from the pellets during the preparation of the pellets, which comprises the steps of:

(a) mixing iron pyrite cinder containing arsenic as an impurity, with solvent refined coal having a softening point in the range of 30° C. to 300° C., wherein the amount of said solvent refined coal is in the range of from 0.5% to 5.0% by weight, based on the weight of said iron pyrite cinder;

(b) molding the mixture into pellets; and

(c) removing arsenic from said pellets by heating said pellets under a reducing atmosphere, at a temperature effective to convert the arsenic impurity to gaseous arsenious acid, thereby reducing the arsenic content of said pellets to an amount not greater than about 0.01 wt. %.

4,549,905

CERAMIC HEATER

Shunzo Yamaguchi, Okazaki; Morihiro Atsumi, Toyohashi, and Takeshi Fukazawa, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

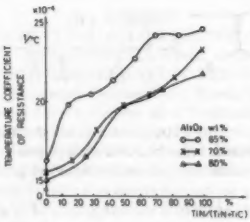
Filed Nov. 14, 1983, Ser. No. 551,687

Claims priority, application Japan, Nov. 17, 1982, 57-201761

The portion of the term of this patent subsequent to May 15, 2001, has been disclaimed.

Int. Cl.⁴ B22F *5/00*; C04B *35/44*; H05B *3/10*

U.S. Cl. 75—238 **6 Claims**



1. A ceramic heater having a heating element consisting essentially of a sintered body of a powdery mixture consisting essentially of

50–15% by weight of titanium nitride and titanium carbide and

balance of alumina.

4,549,906

BASIC FIRE RESISTANT MATERIAL AND SHAPED BODIES THEREFROM

Bernd Wyskott; Rainer Prange; Kurt Möller, all of Hagen, and Joachim Fleischer, Kaarst, all of Fed. Rep. of Germany, assignors to Dolomitwerke GmbH, Wulfrath, Fed. Rep. of Germany

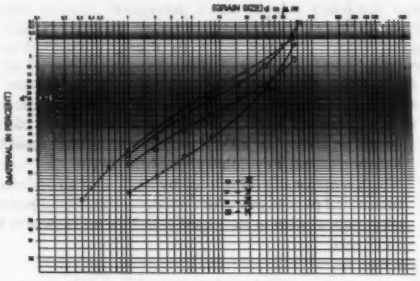
Filed Feb. 1, 1984, Ser. No. 575,914

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1983, 3304119

Int. Cl.⁴ C09D *5/14*

U.S. Cl. 106—16 **8 Claims**

1. A basic fire-resistant material comprised of sintered dolomite and an organic binder having plastic properties which can be highly densified at low pressures, the shaped bodies of such material having intermediate and final strengths in a temperature range between 300° and 1600° C., wherein the binder comprises 3 to 8% by weight of the material and contains 0.1 to 2% by weight of a polysiloxane having a silicon content, calculated as SiO_2, of at least 20% by weight, and 20 to 35% by weight of the fire-resistant basic materials has a particle size smaller than 45 μm, of which 30 to 80% by weight are particles



smaller than 10 μm and more than 10 and less than 30% by weight are particles smaller than 1 μm.

4,549,907

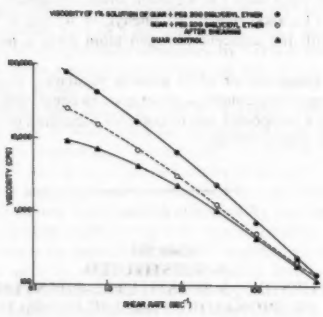
THIXOTROPIC AQUEOUS SOLUTIONS CONTAINING A CROSSLINKED POLYGALACTOMANNAN GUM

Rachel S. Kohn, Springfield, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Dec. 20, 1984, Ser. No. 684,330

Int. Cl.⁴ C08B *37/00*; C08G *59/40*; C09K *7/02*; B01J *13/00*

U.S. Cl. 106—208 **15 Claims**



1. A process for preparing a thixotropic aqueous solution which comprises treating an aqueous medium with a thickening agent comprising (1) polygalactomannan gum, (2) between about 1–10 millimoles of diglycidyl ether of polyoxyalkylene diol per mole of polygalactomannan gum, and (3) a water-soluble basic reagent.

4,549,908

COMPOSITION FOR DECORATIVE GRASS

Erwin H. Weder; Donald E. Weder, and Herbert A. Weder, all of Highland, Ill., assignors to Highland Manufacturing & Sales Co., Highland, Ill.

Division of Ser. No. 506,902, Jun. 23, 1983, Pat. No. 4,496,614. This application Nov. 19, 1984, Ser. No. 672,674

Int. Cl.⁴ A41G *1/00*

U.S. Cl. 106—266 **7 Claims**

1. A color formulation for use in coloring resinous articles directly contacting food, comprising a pigment selected from the group consisting of organic pigments and FD&C pigments, said formulation further comprising a metal stearate, a non-toxic vegetable or mineral oil, and glycerol monooleate.

4,549,909

DEXTRINIZED WAXY STARCH OF EXCELLENT CLARITY AND LUSTER IN AQUEOUS SOLUTION AND PROCESS OF MANUFACTURE

Raj K. Samuel; Ronald J. Kozlowski, both of Hammond, and Frank J. Pustek, Munster, all of Ind., assignors to American Maize-Products Company, Hammond, Ind.

Filed Dec. 19, 1983, Ser. No. 562,711
Int. Cl.[4] C13L *1/10*
U.S. Cl. 127—33 9 Claims

1. A process for manufacturing waxy corn starch dextrins which comprises the steps of:

(a) forming an aqueous slurry of waxy corn starch granules containing from about 25 to about 40% starch solids by weight;

(b) heating the slurry to a temperature of from about 90 to about 115° F. and adjusting the pH of the slurry to about 7.0;

(c) adding sodium or calcium hypochlorite to the slurry in an amount to provide from about 0.1 to about 6.0% of chlorine based on the weight of starch solids;

(d) controlling the rate of addition of said hypochlorite to maintain the pH of the starch slurry between about at least 8.0 and about 8.5;

(e) maintaining the slurry at a temperature of from about 90 to about 115° F. and at a pH between about 8.0 and about 8.5 during treatment of the starch with said hypochlorite;

(f) recovering the treated waxy starch granules from the slurry and adjusting the pH of said recovered granules to not over 3.5; and

(g) heating the granules to dextrinization temperature at a pH of not over 3.5 to convert the waxy starch to dextrin.

7. A waxy corn starch dextrin produced by the process of claim 1 and having a Brookfield viscosity of from about 2,500 to 9,000 cps.

4,549,910

PROCESS FOR THE PROTECTIVE SEALING OF ANODIC ALUMINUM OXIDE AND ITS ALLOYS WHICH CONFERS A PARTICULAR RESISTANCE TO AGRESSIVE ALKALINE AGENTS

Walter D. Barba, Modena, Italy, assignor to Aeromarine Technology, Inc., Tustin, Calif.

Filed May 27, 1983, Ser. No. 498,621
Claims priority, application Italy, Jun. 28, 1982, 40070 A/82
Int. Cl.[4] C25D *11/18*
U.S. Cl. 148—6.27 21 Claims

1. A process for sealing anodic oxide on aluminum and aluminum alloys consisting essentially of the step of: contacting anodically oxidized aluminum or aluminum alloys with a sealing solution comprising:

(a) inorganic ions selected from the group consisting of cations Ni^{++}, Co^{++}, Zr^{++}; anions F^-, $SiF_6^=$, $CrO_4^=$, $WO_4^=$, $MoO_4^=$; and mixtures of said cations and anions; and

(b) a trialkyloxysilane represented by the formula: $X—(CH_2)_y—Si—(OR)_3$ in which "X" is a functional aminic group, "OR" is an alkoxy radical and "y" is 1 to 3.

4,549,911

PROCESSES FOR HEAT TREATING FERROUS MATERIAL

Mircea S. Stanescu, Pluckemin, N.J., and E. Donald Crouch, Jr., Northville, Mich., assignors to The BOC Group, Inc., Montvale, N.J.

Filed Feb. 2, 1984, Ser. No. 576,589
Int. Cl.[4] C21D *1/48*
U.S. Cl. 148—16 9 Claims

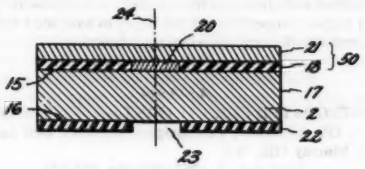
1. A method of heat treating ferrous material in a furnace heated to a temperature of at least 1100° F. comprising the steps of introducing a flow of inert gas into the furnace and supplying a mixture comprised of methylacetylene and propadiene into the furnace such that decarburization of the ferrous material is substantially avoided.

4,549,912

ANODE AND CATHODE CONNECTIONS FOR THE PRACTICE OF ELECTROMIGRATION

Thomas R. Anthony, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 272,801, Jun. 11, 1981, Pat. No. 4,381,598.
This application Dec. 13, 1982, Ser. No. 449,347
Int. Cl.[4] H01L *21/28*
U.S. Cl. 148—33.1 22 Claims



1. A connection useful for the practice of electromigration comprising:

(a) a layer of insulating material, said layer of insulating material being situated on and overlying a preselected major surface of a body of single crystal semiconductor material and having at least one window therethrough, said window having therein a deposit of metal to be electromigrated, said deposit being in contact with said major surface of said body, and

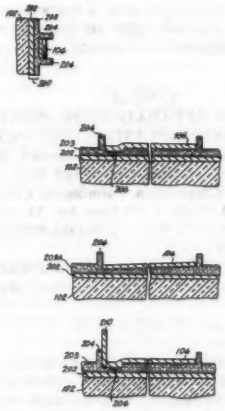
(b) a layer of a conducting material situated on and overlying said layer of insulating material and being in contact with said deposit.

4,549,913

WAFER CONSTRUCTION FOR MAKING SINGLE-CRYSTAL SEMICONDUCTOR DEVICE

Yoshinori Hayafuji; Akashi Sawada; Setsuo Usui, and Akikazu Shibata, all of Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 27, 1984, Ser. No. 574,535
Int. Cl.[4] H01L *23/28, 21/20*
U.S. Cl. 148—33 29 Claims



1. A wafer comprising a substrate base, a thermal zone on said substrate base and a polycrystalline or amorphous seed

layer forming a surface of said wafer in a region overlying said thermal zone, wherein:

said thermal zone provides different rates of heat conduction therethrough as a function of distance measured in at least one of a first direction of said region and a second direction of said region substantially normal to said first direction;

said different rates of heat conduction are provided through said thermal zone as a function of distance measured in said first direction for creating, in response to heating, an increasing temperature gradient in said seed layer in said first direction; and

said different rates of heat conduction are provided through said thermal zone as a function of distance measured in said second direction for creating, in response to heating, a higher temperature at the edges of said seed layer than centrally thereof in said second direction.

4,549,914

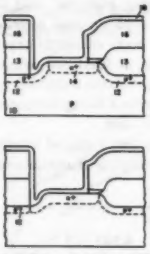
INTEGRATED CIRCUIT CONTACT TECHNIQUE

Kye H. Oh, Allentown, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 9, 1984, Ser. No. 597,924

Int. Cl.[4] H01L *21/225*

U.S. Cl. 148—187 **7 Claims**



1. Method comprising:

forming a first impurity region in a single crystal semiconductor substrate, said substrate having a second impurity region contiguous to the first,

forming a transfer layer of polysilicon overlying the substrate and, in contact with both said first and second regions,

and heating said transfer layer at a temperature and for a time sufficient to cause significant transfer of impurities from said first region to said second region.

4,549,915

METHOD AND APPARATUS FOR PROVIDING FOAMING THERMOPLASTIC COMPOSITIONS

Peter Ritschel, Steinbach; Herbert Freudenreich, Sulbach, and Waldemar Hartmann, Rodheim, all of Fed. Rep. of Germany, assignors to USM Corporation, Farmington, Conn.

PCT No. PCT/GB83/00138, § 371 Date Jan. 11, 1984, § 102(e) Date Jan. 11, 1984, PCT Pub. No. WO83/04040, PCT Pub. Date Nov. 24, 1983

PCT Filed May 16, 1983, Ser. No. 579,892

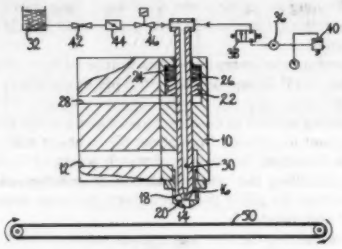
Claims priority, application United Kingdom, May 14, 1982, 8214175

Int. Cl.[4] B32B *31/30*

U.S. Cl. 156—78 **11 Claims**

1. A method of providing a foamed mass for use in an adhesive bonding or sealing process in which a thermoplastic composition is melted by heating to a temperature in excess of 100° C. and expelled through a nozzle from an applicator in admixture with a foaming agent characterized in that the foaming agent is water which is entrained in a stream of carrier gas and injected into the thermoplastic composition as it passes through the nozzle and is thereby distributed throughout the melted composition as it is expelled from the applicator.

10. An applicator device suitable for providing and applying a foamed adhesive mass comprising a heat conductive body portion having a melt supply passageway to provide communication between a source of melted thermoplastic composition and a nozzle orifice from which the composition is to be expelled, a valve element arranged for closing the nozzle orifice to control outflow of adhesive therefrom, characterized in that a gas supply passageway is located within the valve element to



provide communication between sources of water and carrier gas and the nozzle orifice, and in having means for controlling the quantity of water supplied to the carrier gas and means for controlling the pressure of the carrier gas supply, the construction and arrangement being such that upon relative movement between the valve element and nozzle orifice to permit outflow of thermoplastic composition from the orifice, water and carrier gas may be fed under pressure to the composition flowing out through the nozzle and is distributed throughout the melted composition to provide a foamed mass upon expulsion from the applicator.

4,549,916

PATCH POCKET AND FLAP CONSTRUCTIONS

Joseph W. A. Off, Irving, and Judson H. Early, Dallas, both of Tex., assignors to Haggar Company, Dallas, Tex.

Continuation of Ser. No. 266,315, May 22, 1981, abandoned, which is a continuation of Ser. No. 90,663, Nov. 2, 1979, abandoned, which is a division of Ser. No. 948,680, Oct. 5, 1978, abandoned. This application Jul. 5, 1983, Ser. No. 510,998

Int. Cl.[4] B32B *7/08*; B29C *17/04*; B29H *7/04*; A41D *27/20*

U.S. Cl. 156—93 **5 Claims**

1. A method of constructing a flap on a garment of the type comprising a pocket having an open top adapted for efficient use with automated adhesive applicating, folding, positioning and adhesive activating equipment including the steps of:

first, providing first and second fabric layers each having an outside surface and an inside surface;

second, joining the first and second fabric layers with the inside surfaces thereof engaging each other;

said joined first and second fabric layers being substantially coextensive in length and width;

said joined first and second fabric layers forming a flap blank having obverse and reverse sides and an upper edge;

third, securing fusible adhesive to the obverse side of the flap blank adjacent the upper edge thereof with said automated adhesive applicating equipment;

fourth, downwardly folding a portion of the flap blank adjacent the upper edge thereof and having the fusible adhesive secured thereto to orient the fusible adhesive in the direction of the reverse side of the flap blank with said automated folding equipment;

said downwardly folding step dividing the flap blank into a relatively short attaching portion and a relatively long pocket covering portion;

fifth, positioning the reverse side of the folded flap blank having the fusible adhesive thereon adjacent to the outer surface of the garment with said automated positioning equipment with the attaching portion of the outer surface of the garment with the attaching portion of the flap blank positioned in engagement with the outer surface with the garment and adjacent to the open top of the pocket, with the fusible adhesive contacting the outer surface of the garment, and with the pocket covering portion of the flap blank extending over and thereby normally closing the open top of the pocket; and

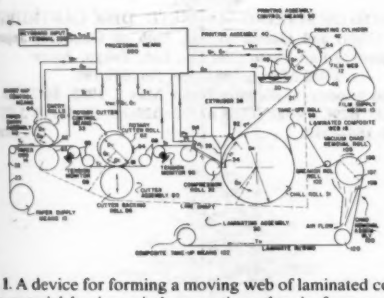
sixth, activating the fusible adhesive with said automated adhesive activating equipment and thereby adhesively securing the folded flap blank to the garment to complete the construction of the flap.

4,549,917

DIE CUT WINDOW LAMINATING DEVICE

James W. Jensen, Jr., Boulder, Colo., assignor to Adolph Coors Company, Golden, Colo.

Filed Feb. 1, 1983, Ser. No. 462,917
Int. Cl.⁴ B32B *31/18*
U.S. Cl. 156—108 **35 Claims**



1. A device for forming a moving web of laminated composite material having window portions therein from a moving continuous web of plastic film material and a moving continuous web of paper material said film material and said paper material each having a lamination side to be laminated to an opposed surface of the other material and a non-lamination side for forming an exterior surface of the laminated composite, said apparatus comprising:

a. paper supply means for providing a continuous web of paper to be laminated, said paper supply means defining the upstream end of said paper web;

b. paper transport means for moving the paper web at a predetermined speed;

c. film supply means for providing a continuous web of film to be laminated, said film supply means defining the upstream end of said film web;

d. film transport means for moving the film web into parallel aligned relationship with the paper web at a speed equal to the predetermined speed of the paper web;

e. cutter means for repeatingly cutting spaced apart perforated window patterns in said paper web, said perforated window patterns defining removeable chad portions of said paper web;

f. wetting means for wetting said film means at spaced apart target areas, said target areas having shapes substantially identical to said perforated window patterns on said paper web and having substantially identical spacing as said perforated window patterns on said paper web;

g. phasing means for providing accurate registry of said perforated window pattern portions of said paper web with said target areas on said film web;

h. adhesive supply means for applying adhesive material to at least one of said film web laminated surface and said paper web laminated surface;

i. laminating means for laminating said paper web to said film web for forming a laminated composite;

j. chad removal means for repeatingly removing said chad portions from associated window patterns whereby spaced apart window apertures are formed; and

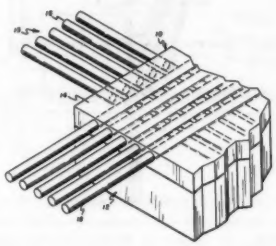
k. composite transport means for continuously moving said composite web through said apparatus.

4,549,918

PRECISION WIRE GRID GLASS DIGITIZING TABLETS

Jack E. Smades, Scottsdale, Ariz., assignor to Sanders Associates, Inc., Nashua, N.H.

Division of Ser. No. 433,602, Oct. 8, 1982, Pat. No. 4,513,043. This application Nov. 21, 1983, Ser. No. 553,895
Int. Cl.⁴ B32B *5/12*
U.S. Cl. 156—160 **23 Claims**



1. A method of fabricating a precision wire grid glass tablet for translating graphic location or movement information into corresponding electrical signals comprising:

forming a first wire grid by stringing wire of ductile material on a frame assembly and aligning and spacing lengths of wire in a parallel array in a common plane;

forming a second wire grid by stringing wire of ductile material on said frame assembly in a second parallel array and second common plane spaced from the first, said second grid comprising parallel lengths of wire perpendicular to the lengths of wire of the first grid;

preparing a flat glass plate by spreading a relatively thin layer of resin material over the flat upper surface of the glass plate;

delaying curing of the resin layer during a period of time permitting the resin layer to distribute evenly and become at least partially settled under the influence of gravity and surface tension;

positioning the frame assembly of first and second wire grids over the glass plate;

tensioning the lengths of wire of the first and second grids to beyond the yield point of the ductile material comprising said wire until the lengths of wire exhibit plastic flow thereby assuring straightness of said lengths of wire prior to immersing said lengths of wire in said resin layer;

raising the glass plate beneath the first and second grids and immersing the lengths of wire of the first and second grids in the resin layer supported on the upper surface of the

glass plate following the at least partial settling of the resin layer under the influence of gravity and surface tension; and

rapidly curing the resin layer whereby the first and second grids are potted in the resin layer and bonded to the structural glass plate.

4,549,919

PROCESS FOR PROVIDING A METAL CONNECTOR FIXED TO A PIPE OF COMPOSITE MATERIAL AND PIPE THUS MADE

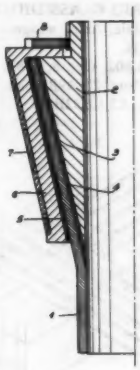
Marcel Auberon, Le Haillan; Daniel Cabanel, Merignac; Michel Dolbeau, Cestas; Albert Phan, Saint-Aubin-de-Medoc; Philippe Pillois, Saint-Medard-en-Jalles; Claude L. Bournazel, Cernay-la-Ville, and Michel Huvey, Bougival, all of France, assignors to Societe Nationale Industrielle et Aerospatiale, Paris and Institut Francais du Petrole, Hauts-de-Seine, both of, France

Filed Jul. 6, 1982, Ser. No. 395,791

Claims priority, application France, Jul. 6, 1982, 81 13232

Int. Cl.⁴ B65H *81/00*

U.S. Cl. 156—172 **22 Claims**



1. Process for providing at least one metal connector fixed to a pipe of composite material which process comprises the following steps:

(a) applying adhesive to the external surface of a metal connector to which material of the pipe is to be adhered;

(b) after drying the adhesive on the metal connector, placing a film of elastomer over the adhesive;

(c) in a chamber, in which the connector from step (b) is placed, vulcanizing the elastomer of the film and curing the adhesive ;

(d) applying a layer of adhesive to the surface of the elastomer film;

(e) after drying the adhesive, forming a pipe over the external surface of the elastomer film by application of layers of not yet polymerised composite material;

4,549,920

METHOD FOR IMPREGNATING FILAMENTS WITH THERMOPLASTIC

Frederic N. Cogswell, Welwyn Garden City, and David J. Hezzell, Biggleswade, both of England, assignors to Imperial Chemical Industries, PLC, London, England

Filed Jan. 20, 1982, Ser. No. 341,187

Claims priority, application United Kingdom, Jul. 28, 1981, 8123159; Nov. 17, 1981, 8134598

Int. Cl.⁴ B05D *1/40;* **D04H** *3/10*

U.S. Cl. 156—181 **8 Claims**

1. A process of producing a fibre-reinforced structure comprising tensioning and aligning a plurality of continuous filaments, the filaments having a diameter of up to 24 microns to provide a band of contiguous filaments, urging the band against a heated spreader surface so as to form a nip between the band and the spreader surface, maintaining a feed of a thermoplastics polymer having a melt viscosity measured at low shear rate of less than 100 Ns/m^2 at the nip, the temperature of the spreader surface being sufficiently high to maintain the polymer in the form of a melt of viscosity less than 100 Ns/m^2 whereby substantially complete wetting of the filaments by the molten polymer is achieved by the action of the tensioned filaments on the melt contained in the nip as the filaments are urged against the heated surface.

4,549,921

LAMINATION OF FLUOROCARBON FILMS

William R. Wolfe, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 28, 1983, Ser. No. 546,546

Int. Cl.⁴ B29C *19/02, 19/06;* **C09J** *5/02*

U.S. Cl. 156—272.6 **1 Claim**

1. Process in which an oriented, melt-fabricable fluorocarbon copolymer film is laminated to another such film or to a substrate by first treating the surface of each film to be laminated to corona discharge in an atmosphere of acetone, then treating the surface of each such film with an adhesive mixture of

A. 5–40% by weight of a copolymer of about 30 to 70% by weight of vinylidene fluoride units and complementally about 70 to 30% by weight of hexafluoropropene units, and

B. 0.5–3% by weight of an isocyanate product made from 1 mole trimethylolpropane and 3 moles toluene diisocyanate in

C. an organic solvent for both A and B;

and then pressing the coated film to another such coated film or to a substrate and heating for at least for 1.5 minutes at from 150° to 175° C. at a pressure of from 8 to 12 psi.

4,549,922

METHOD OF MAKING MAGNETIC DISK CARTRIDGE

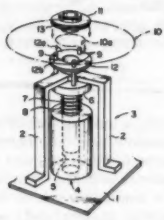
Kengo Oishi, and Osamu Suzuki, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Tokyo, Japan

Filed May 1, 1984, Ser. No. 605,795

Claims priority, application Japan, May 2, 1983, 58-77793

Int. Cl.⁴ B29C *19/00;* **B32B** *31/00;* **B29D** *3/00;* **G11B** *5/82*

U.S. Cl. 156—293 **7 Claims**



1. A method of making a magnetic disk cartridge by positioning a disk-like magnetic recording medium provided at the center with a circular hole between an upper hub and a lower hub concentrically to said upper hub and said lower hub, and fixing said upper hub, said lower hub and said magnetic recording medium to each other by use of a double-faced adhesive member positioned between said upper hub and said magnetic recording medium, wherein the improvement comprises:

(i) positioning at least three guide bars resiliently mounted for axial movement, said guide bars being projected so as to define a circle circumscribed thereabout having the diameter of said circular hole and centering said magnetic recording medium by contacting the inner circumference

of said circular hole of said magnetic recording medium with said guide bars,

(ii) providing a plurality of through holes in a medium-grasping portion of said lower hub, the latter serving for engagement with a disk-rotating shaft of a recording and reproducing apparatus, said through holes being dimensioned for tight insertion of said guide bars thereinto and positioned at equal distances from the center of said lower hub,

(iii) inserting said guide bars into said through holes of said lower hub and supporting said lower hub on said guide bars,

(iv) engaging the inner circumference of said circular hole of said magnetic recording medium with said guide bars to center said magnetic recording medium relative to said lower hub and mounting said magnetic recording medium on said lower hub, and

(v) thereafter pushing the end portions of said guide bars by lowering said upper hub to which said double-faced adhesive member is secured, thereby moving said guide bars away from the surface of said magnetic recording medium and securing said double-faced adhesive member to both said magnetic recording medium and said lower hub.

4,549,923

SLEEVE-TYPE GRAVURE PRINTING CYLINDER AND METHOD AND APPARATUS FOR ITS ASSEMBLY

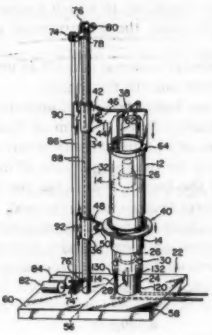
Eiichi Tachibana, Toda; Koushou Murayama, Kawasaki, and Kenzo Isumi, Kameoka, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 326,500, Dec. 2, 1981, Pat. No. 4,461,663. This application Aug. 2, 1983, Ser. No. 519,559

Claims priority, application Japan, Dec. 4, 1980, 55-171318; Mar. 5, 1981, 56-31530; May 22, 1981, 56-76498; May 22, 1981, 56-76499; May 22, 1981, 56-76500

Int. Cl.⁴ B05C *3/00;* **B30B** *12/00*

U.S. Cl. 156—423 **7 Claims**



1. An apparatus for assembling a gravure printing cylinder of the type having a printing sleeve fitted over a core roll, the apparatus comprising:

a roll holder for immovably holding the core roll in a vertical upstanding attitude;

an upstanding guide column set up along the core roll on the roll holder;

upper and lower carriages movable up and down along the guide column;

drive means connected to said carriages for reciprocably moving the same along the guide column with a constant vertical distance maintained between the upper and lower carriages;

a hotmelt applicator movable over the surface of the core roll on the roll holder longitudinally of the core roll for coating the core roll with a hotmelt adhesive, said hotmelt applicator being mounted on said lower carriage so as to be pivotable about a vertical pivot axis to and away from a position of vertical register with the roll holder, said hotmelt applicator being in the form of an annular trough containing the hotmelt adhesive and surrounding the core roll on the roll holder so as to hold the contained adhesive in direct contact with the core roll; and

a sleeve mounting pusher for pushing the printing sleeve onto the core roll on the roll holder, said pusher comprising a rimmed ring for engaging the upper end of the printing sleeve, said pusher being mounted on said upper carriage so as to be pivotable about a vertical pivot axis to and away from a position of vertical register with the roll holder.

4,549,924

DEVICE FOR INSTANTANEOUSLY CHANGING THE GLUING WIDTH OF A WEB OF PAPER IN THE MANUFACTURE OF CORRUGATED CARDBOARD, AND PROCESS FOR USE OF SUCH A DEVICE

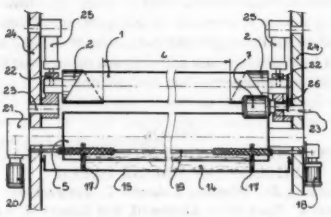
Daniel Berthelot, Montluel, and Jean-Paul Girerd, les Avenieres, both of France, assignors to S. A. Martin, Villeurbanne, France

Filed Jan. 5, 1984, Ser. No. 568,463

Claims priority, application France, Jan. 28, 1983, 83 01307

Int. Cl.⁴ B32B *1/00*

U.S. Cl. 156—470 **3 Claims**



1. Device for an instantaneously changing gluing width on a web of paper in the manufacture of corrugated cardboard, glue being applied to said web (**9**) by means of a gluing cylinder (**5**) having two ends, driven rotationally and partly dipping into glue (**14**) over a width determined by an adjustable device (**17**), said device comprising a detachable auxiliary doctor device comprising two doctors (**2**) applied momentarily to said two ends of said gluing cylinder, on the upstream non-immersed part of the latter, said doctor device being equipped with means (**7**) for adjusting the distance (L) left free for the passage of glue between said two doctors (**2**), and with means (**25**) for moving said doctors (**2**) between an operative position bearing against said cylinder (**5**) and a disengaged position out of contact with said cylinder (**5**).

4,549,925

SPLICER PLUNGER ASSEMBLY

Louis J. Goguen, New Brunswick, Canada, assignor to King Instrument Corporation, Westboro, Mass.

Filed Nov. 22, 1982, Ser. No. 443,562

Int. Cl.⁴ B31F *5/06;* **B65H** *69/06*

U.S. Cl. 156—506 **5 Claims**

1. In a splicing tape dispenser-applicator of the type comprising:

(a) at least one member defining a guide channel;

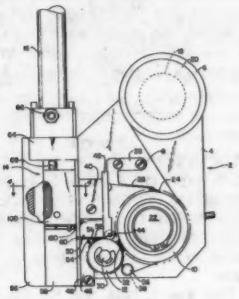
(b) a plunger assembly mounted for reciprocating movement lengthwise within said channel; and

(c) tape feed means for feeding splicing tape into said channel upon command, in order that a length of splicing tape fed into said channel by said tape feed means may be severed and applied by said plunger assembly to adjoining

lengths of tape to be spliced when said plunger is reciprocated within said channel,

the improvement wherein:

said plunger assembly comprises a plunger and at least one elongate low-friction bearing device carried by said plunger and disposed so as to engage said at least one member and thereby lessen the friction between said



plunger and said at least one member when said plunger assembly is reciprocated longitudinally within said channel, and further wherein said at least one low-friction bearing device is disposed in and protrudes from a bore formed in said plunger and extending at a right angle to said at least one member and the path of reciprocal movement of said plunger within said channel.

4,549,926

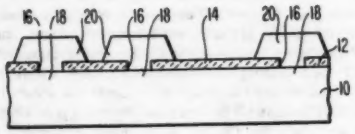
METHOD FOR GROWING MONOCRYSTALLINE SILICON ON A MASK LAYER

John F. Corboy, Jr., Ringoes; Lubomir L. Jastrzebski, Plainsboro; Scott C. Blackstone, Hopewell, and Robert H. Pagliaro, Jr., Trenton, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Division of Ser. No. 338,958, Jan. 12, 1982, abandoned. This application Nov. 18, 1983, Ser. No. 553,305

Int. Cl.[4] **C30B** *25/04*

U.S. Cl. 156—612 **24 Claims**



1. A method for forming monocrystalline silicon over a mask layer comprising:

providing a semiconductor substrate having a monocrystalline portion at a surface thereof and having a mask layer on said surface, the mask layer having an aperture to said monocrystalline portion;

depositing silicon from a silicon-source gas for a period substantially equal to a critical time, so as to form monocrystalline silicon on exposed monocrystalline silicon regions and non-monocrystalline silicon on the mask layer, said critical time being a time at which said non-monocrystalline silicon can be removed from the mask layer by etching in situ while retaining a portion of the deposited monocrystalline silicon;

etching in a silicon-etching as, in situ, directly after said depositing, so as to remove the non-monocrystalline silicon from the mask layer while retaining a portion of the deposited monocrystalline silicon;

repeating said deposition and etching cycle, so as to achieve a monocrystalline silicon island extending from the substrate surface at the mask aperture and overlapping the mask layer a predetermined distance; and

removing the silicon overlying each mask aperture so as to expose the substrate surface and form a cavity between portions of deposited monocrystalline silicon.

4,549,927

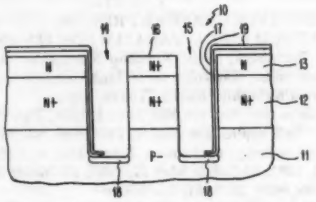
METHOD OF SELECTIVELY EXPOSING THE SIDEWALLS OF A TRENCH AND ITS USE TO THE FORMING OF A METAL SILICIDE SUBSTRATE CONTACT FOR DIELECTRIC FILLED DEEP TRENCH ISOLATED DEVICES

George R. Goth; Thomas A. Hansen, Poughkeepsie, and James S. Makris, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1984, Ser. No. 626,271

Int. Cl.[4] **H01L** *21/306;* **B44C** *1/22;* **C03C** *15/00;* **C23F** *1/02*

U.S. Cl. 156—643 **23 Claims**



1. In a process of forming semiconductor devices in a semiconductor structure according to which a passivated trench is produced in the structure, the improvement comprising the steps of:

depositing an underlay material to form an underlay layer to coat the structure and fill the trench;

depositing a barrier layer above said underlay layer;

patterning said barrier layer to form at least one opening which overlaps only partially the structure and the trench area, delineating the desired portions of the sidewalls, of the bottom of the trench and of the top surface of the structure, adjacent thereto, to be exposed;

anisotropically etching the underlay material which is exposed through said opening, thereby selectively exposing said desired portions for further processing.

4,549,928

TELEVISION PANEL AND METHOD OF MANUFACTURE

Wendell S. Blanding, Painted Post, N.Y.; Ronald E. Johnson, Tioga, Pa., and Robert V. VanDewoestine, Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

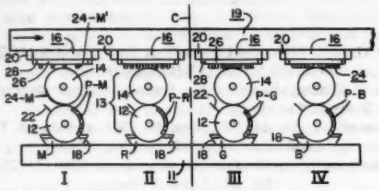
Filed Sep. 29, 1982, Ser. No. 427,515

Int. Cl.[4] **B44C** *1/44;* **B32B** *31/00;* **C03C** *15/00;* **B41C** *1/00*

U.S. Cl. 156—660 **9 Claims**

1. A method of producing a target for a color TV panel, the target formed of a composite pattern of a black matrix and respective red, blue and green color phosphors comprising the steps of: formulating a separate composition of thermoplastic, pressure-sensitive ink for each of the black matrix and color phosphors, said inks exhibiting cohesive strength and pressure sensitivity at near room temperature; forming each composition into a corresponding separate pattern; establishing the black matrix and respective color phosphors in the separate patterns on separate surfaces; completely transferring and

registrably combining the separate patterns into the composite pattern onto at least one collector; and completely transferring



the composite pattern from the collector to the panel to form the target thereon.

4,549,929

TIN COMPOUNDS FOR BRIGHTNESS IMPROVEMENT OF JACK PINE ULTRA

Ching-Hua Tay, Mississauga, and Raymond S. Fairchild, Burlington, both of Canada, assignors to Abitibi-Price Inc., Toronto, Canada

Filed Aug. 6, 1984, Ser. No. 638,073

Claims priority, application United Kingdom, Sep. 6, 1983, 8323808; Dec. 1, 1983, 8332143

Int. Cl.⁴ D21C *9/00*

U.S. Cl. 162—78 **13 Claims**

1. A method of brightening an ultra high yield wood pulp containing discoloring metal ions present from at least one of the group consisting of ferrous, ferric, cupric, aluminum, nickel and manganese ions which comprises adding to said pulp a composition consisting of at least 0.001% Sn ions derived from the group consisting of stannous chloride, stannous sulphate, stannous tartrate, stannous oxalate, stannic chloride and stannic sulphate, on a pulp dry weight basis.

4,549,930

UNCOATED PAPER WEB FOR PRINTING AND METHOD FOR MAKING AND USING SAME

Guido Dessauer, Düsseldorf, Fed. Rep. of Germany, assignor to Feldmühle Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Apr. 2, 1980, Ser. No. 136,557

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1979, 2913941

Int. Cl.⁴ D21F *11/00*

U.S. Cl. 162—134 **8 Claims**

1. In a method for rotogravure printing on a paper using a printing ink containing water-immiscible solvents, the improvement which comprises the paper comprising a fibrous paper web, the fibers of which are partially or totally enveloped with a coating of a clay hydrogel which clay is hydratable, is colloidal and is film-forming, said web having an area weight of from about 45 to 100 g/m^2, a density of from about 0.95 to 1.2 g/cc and a smoothness of from about 600 to 1500 Bekk seconds and containing conventional inorganic fillers in amounts of more than 15% by weight expressed as the ash content wherein the hydratable, film-forming, colloidal clay contains a montmorillonite mineral selected from the group consisting of minerals in which the ratio of sodium and calcium is between 40:60 and 60:40 and minerals whose ion portion is composed of up to 40% magnesium ions with the remainder of the ion portion being sodium ions.

4,549,931

INORGANIC BINDERS FOR ARTICLES FORMED FROM FIBERS

John A. Adamowicz, Corning; John R. Schlup, Horseheads, and Mark S. Spotz, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jan. 27, 1983, Ser. No. 461,673

The portion of the term of this patent subsequent to Jun. 12, 2001, has been disclaimed.

Int. Cl.⁴ D21H *3/78*

U.S. Cl. 162—145 **7 Claims**

1. An article exhibiting good heat stability and a high mechanical strength as evidenced by a modulus of rupture greater than 100 psi which is relatively insensitive to changes in the relative humidity of the surrounding environment consisting essentially of:

(a) organic and/or inorganic fibers; and

(b) at least 5% by weight of a binder in the form of floc composed of a product of an ion exchange reaction between

(I) crystals of a lithium and/or sodium water-swelling mica selected from the group of fluorhectorite, hydroxyl hectorite, boron fluorphlogopite, hydroxyl boron phlogopite, and solid solutions among those and between those and other structurally-compatible species selected from the group of talc, fluortalc, polylithionite, fluorpolylithionite, phlogopite, and fluorphlogopite; and

(II) an organic polycation, and/or an aminosilane, and/or an organic chrome complex;

said high mechanical strength being the result of the structure of said articles consisting of fibers entangled in fiber/floc agglomerates, those agglomerates retaining a high percentage of said binder, and a reaction occurring between said organic polycation and/or said aminosilane and/or said organic chrome complex and said fibers.

4,549,932

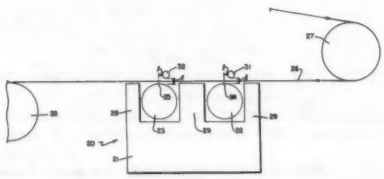
APPARATUS AND PROCESS FOR A DECURLING SYSTEM

William J. Goetz, Appleton, and Thomas G. Engel, Menasha, both of Wis., assignors to Appleton Papers, Inc., Appleton, Wis.

Filed Apr. 27, 1981, Ser. No. 257,947

Int. Cl.⁴ D21F *11/00*

U.S. Cl. 162—207 **8 Claims**



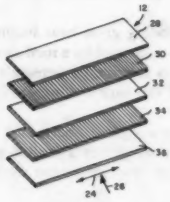
1. A steam decurling apparatus which comprises means for introducing a web material into a moistening environment, means for providing steam showers to at least one surface of said web material and means for restricting and stabilizing said web material, said stabilizing means positioned opposite said steam shower means so as to confine the area of the steam shower and web material to maintain a substantially constant distance of about ¾" or less between said web material and source of steam showers while applying minimal contact to said web material.

4,549,933

DOCTOR BLADE WITH NON-HOMOGENEOUS STIFFNESS PROPERTIES

Michael Judd, Paxton, and Joseph S. Cooper, Worcester, both of Mass., assignors to Thermo Electron Corporation, Waltham, Mass.

Filed Jul. 5, 1983, Ser. No. 510,883
Int. Cl.⁴ D21G *3/00, 3/02, 3/04*
U.S. Cl. 162—281 **9 Claims**



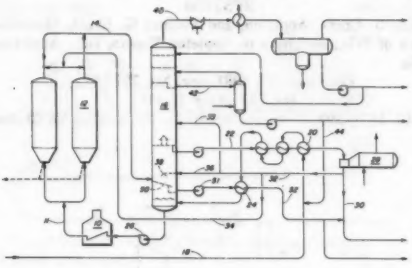
1. An elongated doctor blade having a side edge structured for application to a roll surface in a paper making machine, said blade comprising: an inner first layer of fibrous material lying on a neutral axis of said blade, and a plurality of second layers juxtaposed on opposite sides of said inner first layer, said second layers having uni-directional graphite fibers oriented so as to provide said blade with a stiffness in the direction perpendicular to said edge which is greater than the stiffness of said blade in the direction parallel to said edge.

4,549,934

FLASH ZONE DRAW TRAY FOR COKER FRACTIONATOR

Harlan G. Graf; Harry R. Janssen, and George A. Kurdy, all of Ponca City, Okla., assignors to Conoco, Inc., Ponca City, Okla.

Filed Apr. 25, 1984, Ser. No. 603,869
Int. Cl.⁴ C10G *7/00*
U.S. Cl. 196—98 **7 Claims**



1. In a delayed coking unit comprising a coker furnace, at least two coking drums, fresh feed line means, coker transfer line means extending from said furnace to said drums, a coker fractionator, vapor line means extending from said drums to said fractionator, and means in said fractionator for condensing the heavier components of vapor entering said fractionator from said vapor line means, the improvement comprising:

(a) an internal draw tray (**50**) in said coker fractionator, said tray being below the vapor line means inlet to said coker fractionator and below said means for condensing the heavier components of vapor and being adapted to collect said condensed vapor components, and

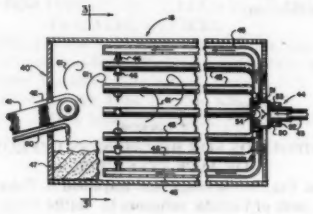
(b) means for removing from said coker fractionator and said coking unit said condensed vapor components collected on said internal draw tray.

4,549,935

CONDITIONING DRUM FOR A TAR SANDS HOT WATER EXTRACTION PROCESS

Shimon S. Tchernyak, Edmonton, Canada, assignor to Suncor, Inc., Toronto, Canada

Division of Ser. No. 248,780, Mar. 30, 1981, abandoned. This application Jun. 16, 1983, Ser. No. 505,004
Claims priority, application Canada, Apr. 8, 1980, 349292
Int. Cl.⁴ C10C *3/08*
U.S. Cl. 196—14.52 **1 Claim**



1. A tar sand conditioning vessel comprising:

(a) a cylindrical drum rotatable around its longitudinal axis, said drum having at least one opening at each end thereof such that mined tar sands to be conditioned can be introduced into one end of said drum, mixed with steam and water, and discharged from the opposite end thereof;

(b) a steam distribution fitting axially disposed proximate one end of said drum, said fitting including a stationary portion connected to a source of steam and a rotatable portion having a plurality of radially distributed outlet ports, said stationary and rotatable fitting portions being coupled to provide a continuous supply of steam to each of said outlet ports regardless of the angular position thereof; and

(c) a steam distribution network including:

(i) a plurality of steam conduits generally longitudinally arrayed around the inner periphery of said drum, a first end of each of said conduits being connected to one of said fitting outlet ports, second ends of said conduits all being closed off; and

(ii) at least one radially inwardly directed steam discharge nozzle being affixed to each of said conduits proximate the closed end thereof;

whereby steam is continuously discharged from all said nozzles to correspondingly continuously generate a dense steam cloud in the drum interior and heat the inner wall and components of said drum as it rotates in order to transfer heat to the tar sand pulp being conditioned (1) by radiation, (2) by convection, (3) by droplet formation, and (4) by sparging the steam beneath the pulp surface.

4,549,936

COMBINED DISTILLATION APPARATUS AND HOT LIQUID SYSTEM

James L. Erickson, 417 River Ave., Sauk Rapids, Minn. 56379

Filed Sep. 30, 1983, Ser. No. 537,819
Int. Cl.⁴ B01D *3/02*
U.S. Cl. 202—167 **13 Claims**

1. A combined water heating system and distillation apparatus for preheating a source of cold incoming water to supply hot water to a utilization device while simultaneously distilling the water to purify the water comprising:

a hot water heater to heat the water to a predetermined temperature;

means for connecting said hot water heater to the utilization

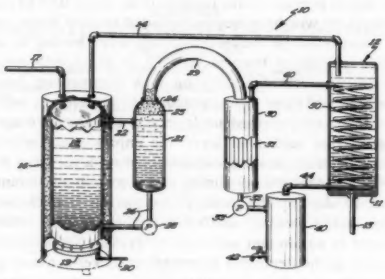
device so as to be able to supply hot water to the utilization device;

means designed, sized and arranged for recovering otherwise wasted energy from launderies, households, car washes, power facilities, industrial facilities and the like, for distilling water, including:

a cold water storage tank connectable to the source of cold incoming water and connected in fluid flow relationship in said hot water heater to deliver the cold water from said storage tank to said hot water heater;

an evaporation chamber connected in fluid flow relationship with said heater for evaporating the heated water in said chamber into vapor so that the hot water will flow from said hot water heater into said evaporation chamber;

outlet means connecting said evaporation chamber with said heater to convey hot water between said chamber and said heater;



a condenser connected in fluid flow relationship with said evaporation chamber to receive the vapor exiting said evaporation chamber and convert it to distilled water;

a distilled water storage vessel connected in fluid flow relationship to said condenser for containment of the distilled water leaving said condenser; and

a heat dissipation coil connected in fluid flow relationship between said distilled water storage vessel and said condenser and positioned within said cold water storage tank to lower the temperature of the distilled water flowing through said coil from said distilled water storage vessel to said condenser and to preheat the cold incoming water within said tank so that much of the heat released during condensation is being recaptured by water within said cold water storage tank for subsequent return to said hot water heater.

4,549,937

PROCESS FOR SEPARATING THE CATALYST SYSTEM FROM THE REACTION MIXTURES OF CARBONYLATION REACTIONS

Heinz Erpenbach, Cologne; Klaus Gehrmann; Peter Hörstermann, both of Erftstadt; Hans-Klaus Kübbeler, Swisttal, and Georg Kohl, Hürth, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 16, 1982, Ser. No. 442,107

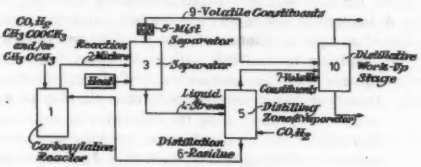
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1981, 3149092

Int. Cl.⁴ B01D *3/06;* **C07C** *51/56*

U.S. Cl. 203—40 **4 Claims**

1. A process for separating a catalyst system from a reaction mixture obtained by reacting methyl acetate or dimethylether or a mixture thereof with carbon monoxide or a mixture of carbon monoxide and hydrogen at elevated temperatures to acetic anhydride in the presence of the catalyst system, said catalyst system comprising carbonyl complexes of noble metals belonging to Group VIII of the Periodic System, acetic acid, methyl iodide and an organophosphorus or organonitrogen compound, and said reaction mixture issuing from a reaction zone under a pressure of 25 to 150 bars at a temperature of 100° to 250° C., which comprises:

heating a separator to 60° to 140° C., introducing the reaction mixture coming from the reaction zone into said separator and releasing the reaction mixture to a pressure of 0.5 to 3.5 bars with spontaneous evaporation of the



volatile constituents of said reaction mixture; delivering a stream of liquid matter coming from the separator to a distilling zone and distilling off volatile constituents still contained therein under a pressure of 0.05 to 1 bar at a base temperature of 70° to 170° C.; and recycling the catalyst system retained as base product to the reaction zone.

4,549,938

SEPARATION OF METHANOL FROM METHYL ACETATE BY EXTRACTIVE DISTILLATION

Lloyd Berg, and An-I Yeh, both of 1314 S. Third Ave., Bozeman, Mont. 59715

Division of Ser. No. 485,006, Apr. 14, 1983,. This application Mar. 23, 1984, Ser. No. 592,600

Int. Cl.⁴ B01D *3/40;* **C07C** *29/84*

U.S. Cl. 203—51 **23 Claims**

1. A method for recovering methanol from a mixture of methanol and methyl acetate which comprises distilling a mixture of methanol and methyl acetate in a rectification column in the presence of about one to two parts of an extractive agent per part of methanol-methyl acetate mixture, recovering essentially pure methanol as overhead product and obtaining the extractive agent and methyl acetate from the stillpot or reboiler, the extractive agent comprises at least a mono nitro hydrocarbon containing from one to eight carbon atoms.

4,549,939

PHOTOELECTROFORMING MANDREL AND METHOD OF ELECTROFORMING

James S. Kenworthy, Rockland, and Thomas G. Kozinski, South Attleboro, both of Mass., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 30, 1984, Ser. No. 605,506

Int. Cl.⁴ C25D *1/00, 17/12*

U.S. Cl. 204—4 **13 Claims**

1. An article of manufacture for use as a mandrel in a process for electroforming a metallic part comprising:

a. a nonconductive substrate which transmits actinic radiation;

b. applied to said substrate a material which masks the transmission of actinic radiation in a desired pattern;

c. on a surface of the patterned substrate, a continuous conductive film which transmits actinic radiation; and

d. over the conductive film, a discontinuous layer of photoresist defining a pattern corresponding with the pattern applied to said substrate.

4,549,940

METHOD FOR SURFACE TREATING COPPER FOIL

Steven J. Karwan, RD 1, Princeton, N.J. 08540

Continuation-in-part of Ser. No. 602,842, Apr. 23, 1984,. This application Mar. 8, 1985, Ser. No. 709,616
Int. Cl.[4] C25D *1/04, 5/10, 5/16, 5/18*
U.S. Cl. 204—13 13 Claims

1. A method for treating the surface of copper foil to improve the bond strength thereof, consisting essentially of:

A. immersing said copper foil in a bath consisting essentially of an aqueous solution of copper sulfate and sulfuric acid;

B. applying to the bath with said copper foil immersed therein, a continuous treatment of electric current, said treatment consisting essentially of a plurality of pulsing treatment cycles to cause the deposition on the surface of said copper foil of an adherent, irregular surface of improved bonding capability, each of said pulsing treatment cycles consisting essentially of a first peak current phase and a second base current phase;

(i) said peak current phase performed at a current density and for a duration sufficient to form on at least one surface of said foil a fully adherent nodular layer on said surface, said nodular layer consisting essentially of copper, such current density and duration insufficient however, to form a nodular layer that exhibits treatment transfer and requires further treatment to anchor said nodular layer to the surface of said foil;

(ii) said base current phase performed at a current density of a magnitude less than those of said peak current phase, and at a current density and for a duration sufficient to dispose over said nodular layer a thin, tightly adherent layer of smooth copper to interrupt the formation of said nodular layer, but insufficient to anchor said nodular layer to said foil surface; and

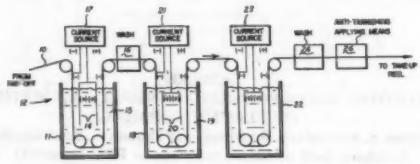
(iii) wherein said pulsing treatment cycles are each as short as milliseconds in total duration.

4,549,941

ELECTROCHEMICAL SURFACE PREPARATION FOR IMPROVING THE ADHESIVE PROPERTIES OF METALLIC SURFACES

Arvind Parthasarathi, Hamden, and Ned W. Polan, Madison, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Nov. 13, 1984, Ser. No. 670,236
Int. Cl.[4] C25D *5/10, 5/34, 5/48, 17/00*
U.S. Cl. 204—27 21 Claims



1. A method for improving the adhesive properties of a metallic material in a wrought condition, said method comprising:

forming a plurality of copper or copper oxide dendritic structures on at least one surface of said wrought metallic material,

wherein the improvement comprises:

plating a layer of copper onto said at least one surface just prior to said dendritic structure forming step to render said at least one surface more uniformly electrochemically active and to thereby reduce the number of unplated regions on said at least one surface.

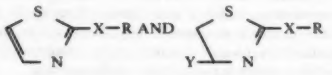
4,549,942

PROCESS FOR ELECTRODEPOSITING COMPOSITE NICKEL LAYERS

Robert A. Tremmel, Woodhaven, and Doina Magda, Grosse Pointe Park, both of Mich., assignors to OMI International Corporation, Warren, Mich.

Continuation-in-part of Ser. No. 495,793, May 23, 1983, abandoned, which is a continuation-in-part of Ser. No. 280,643, Jul. 6, 1981, Pat. No. 4,384,929. This application Apr. 20, 1984, Ser. No. 601,350
The portion of the term of this patent subsequent to May 24, 2000, has been disclaimed.
Int. Cl.[4] C25D *5/14*
U.S. Cl. 204—40 8 Claims

1. In a process for electrodepositing a composite three-layered nickel-containing layer on a substrate wherein an inner nickel-containing layer having an average sulfur content of less than about 0.3 percent by weight is electrodeposited on the substrate, an adherent intermediate nickel-containing layer having an average sulfur content from about 0.05 to about 0.5 percent by weight is electrodeposited on said inner layer and an outer adherent nickel-containing layer having an average sulfur content of from about 0.02 to about 0.15 percent by weight is electrodeposited on said intermediate layer and, wherein, said outer layer contains a lower average sulfur content than said intermediate layer and a higher average sulfur content than said inner layer, the improvement which comprises electrodepositing said intermediate layer from an aqueous acidic solution containing nickel ions in an amount sufficient to deposit the desired intermediate nickel-containing layer and a thiazole and/or thiazoline additive compound present in an amount sufficient to provide the desired sulfur content in the deposited intermediate nickel-containing layer, said thiazole and/or thiazoline additive compound having the structural formulae:



wherein:
X is S, NH;
R is H, R′;
R′ is $-(CH_2)_n$, $-SO_3M$, $-(CH_2)_n CO_2M$;
n is an integer from 1 to 4;
Y is $-SO_3M$;
M is Na, K, NH_4, H;
as well as mixtures thereof.

4,549,943

SUSPENSION BATH AND PROCESS FOR PRODUCTION OF ELECTROLYTIC MANGANESE DIOXIDE

Geoffrey W. Mellors, North Royalton, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Nov. 1, 1984, Ser. No. 667,163
Int. Cl.[4] C25B *1/00*
U.S. Cl. 204—96 25 Claims

1. A bath for the production of electrolytic manganese dioxide comprising (a) between about 0.5 and about 1.3 moles/liter of an aqueous solution of at least one manganese salt selected from the group consisting of manganous sulfate, manganous chloride and manganous nitrate; (b) a sufficient quantity of at least one acid selected from the group consisting of sulfuric acid, hydrochloric acid and nitric acid so that the pH of said bath is between about 1 and about 2; and (c) at least one suspension agent which is selected from the group consisting of insoluble multivalent elements and of insoluble compounds of multivalent metals other than manganese.

4,549,944

ELECTROCHEMICAL DEVELOPING PROCESS FOR REPRODUCTION LAYERS

Engelbert Pliefke, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 17, 1982, Ser. No. 408,906

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1981, 3134054

Int. Cl.[4] C25F *3/02, 5/00*

U.S. Cl. 204—129.1 20 Claims

1. A process for developing exposed light-sensitive reproduction layers using an aqueous electrolyte developer; said process comprising removing by electrochemical treatment those parts of the exposed layer which correspond to the non-image areas, wherein said aqueous electrolyte developer comprises at least one salt of an organic or inorganic acid and/or at least one weak acid or base.

4,549,945

UV CURED POLYURETHANES USING ORGANOTIN PROMOTERS

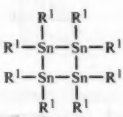
Merlin R. Lindstrom, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 11, 1984, Ser. No. 569,812

Int. Cl.[4] C08F *2/50;* C08G *18/24*

U.S. Cl. 204—159.11 8 Claims

1. A photocurable composition consisting essentially of a mixture of (a) a diisocyanate of the formula OCN—R″—NCO wherein R″ is a C_4 to C_{20} alkylene, arylene, alkarylene, or aralkylene radical; (b) a polyol; and (c) at least one organotin compound of the formula



wherein each R^1 independently represents a C_3 to C_{10} branched alkyl, cycloalkyl, or aryl radical; wherein the amount of said organotin compound is about 0.1 to 5.0 weight percent based on the total weight of the diisocyanate/polyol/organotin reaction mixture and wherein the ratio of said diisocyanate to said polyol is about 1:1 to 1:1.2 based on the equivalent weights of said diisocyanate and said polyol.

4,549,946

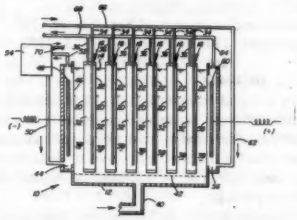
PROCESS AND AN ELECTRODIALYTIC CELL FOR ELECTRODIALYTICALLY REGENERATING A SPENT ELECTROLESS COPPER PLATING BATH

Richard E. Horn, Pittsburgh, Pa., assignor to Electrochem International, Inc., Pittsburgh, Pa.

Filed May 9, 1984, Ser. No. 608,512

Int. Cl.[4] B01D *13/02*

U.S. Cl. 204—182.4 17 Claims



10. A process for electrodialytically regenerating an aqueous, spent electroless copper plating bath, said spent copper plating bath containing alkali metal sulfate and alkali metal formate as reaction products of the electroless plating process comprising the steps of,

introducing said spent copper plating bath into a regeneration compartment of an electrodialytic cell,

electrodialytically transferring sulfate and formate ions in said spent copper plating bath through an anionic membrane into an acid formation compartment,

electrodialytically transferring hydroxyl ions through the anionic portion of a bipolar membrane to a regeneration compartment to regenerate said bath,

combining said sulfate and formate ions with hydrogen ions in said acid formation compartment to form sulfuric acid and formic acid, and

introducing water into said acid formation compartment to provide hydroxyl ions and hydrogen ions.

4,549,947

METHOD AND APPARATUS FOR DEHYDRATION OF WATER-CONTAINING SUBSTANCE BY ELECTRO-OSMOSIS

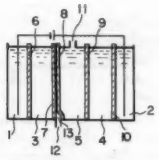
Tadashi Inoue, Fujisawa, and Tetsuro Tanaka, Yokohama, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 21, 1983, Ser. No. 563,732

Claims priority, application Japan, Dec. 27, 1982, 57-227062; Feb. 8, 1983, 58-18126; Feb. 9, 1983, 58-18949; Aug. 19, 1983, 58-150268

Int. Cl.[4] B01D *13/02*

U.S. Cl. 204—182.4 20 Claims



11. An apparatus for the dehydration of a water-containing substance by electro-osmosis, comprising an anode and a cathode and; a receiving compartment formed in a space between said anode and said cathode including a pair of diaphragms of semi-permeable membranes, one diaphragm arranged toward said anode and the other arranged toward said cathode, and a microporous membrane arranged therebetween; said microporous membrane and said diaphragm arranged toward said cathode have at least major parts of their opposed surfaces in contact with each other so that a liquid can be retained on an interface therebetween by surface tension, which includes said major parts being in intimate contact with each other, and the remaining minor parts of said opposed surfaces are separate by a distance large enough to provide a space for withdrawal of water.

4,549,948

SACRIFICIAL ANODE COMPOSITION

Marvin L. Peterson, Ponca City, Okla.; Charles F. Putnik, Katy, Tex., and Orwin G. Maxson, Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

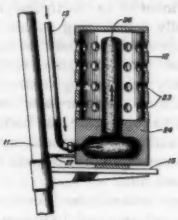
Division of Ser. No. 180,235, Aug. 22, 1980, Pat. No. 4,318,787, which is a continuation-in-part of Ser. No. 123,863, Feb. 22, 1980, abandoned. This application Jun. 8, 1981, Ser. No. 271,490

Int. Cl.[4] C23F *13/00*

U.S. Cl. 204—196 5 Claims

1. An extrudable composition, particularly suitable for providing cathodic protection of metal structures, said composition consisting essentially of from about 60 to about 90 weight

percent of particles of zinc, aluminum, magnesium or alloys thereof, said particles having a maximum dimension of less than 6 mm, and from about 10 to about 40 weight percent of a thixotropic carrier material, said thixotropic carrier material



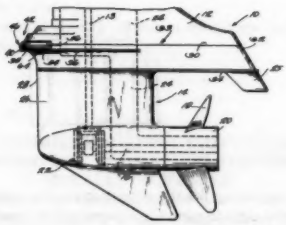
having a solubility in sea water of about 0.1 to about 5.0 weight percent and a viscosity of less than 2,000,000 cp. at 4° C., said thixotropic carrier material being selected from the group consisting of ethoxylated alcohols, ethoxylated mono- or dialkyl phenols and sulfated alcohol ethoxylates.

4,549,949

MARINE PROPULSION DEVICE INCLUDING CATHODIC PROTECTION

Douglas B. Guinn, Shorewood, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jun. 7, 1984, Ser. No. 618,370
Int. Cl.[4] C23F *13/00*
U.S. Cl. 204—197 **9 Claims**



1. A lower unit for a marine propulsion device comprising a housing having a lower portion with an outer surface which is normally submerged in water and with an inner surface defining an internal passage which communicates with the water and which is exposed to water when the lower portion is submerged in water, and a sacrificial anode mounted on said submerged lower portion of said housing and including a first portion having a first surface which constitute a part of said outer surface of said lower portion and which is exposed to water exterior to said housing and a second portion having a second surface which constitutes a part of said inner surface of said lower portion and which is exposed to water present in said passageway.

4,549,950

SYSTEMS FOR PRODUCING ELECTROPLATED AND/OR TREATED METAL FOIL

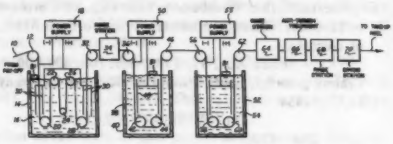
Ned W. Polan, Madison; Raymond J. Smialek, Cheshire, and Arvind Parthasarathi, Hamden, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Nov. 13, 1984, Ser. No. 670,232
Int. Cl.[4] C25D *17/00, 21/06, 21/18*
U.S. Cl. 204—206 **22 Claims**

1. A system for producing metal or metal alloy foil, said system comprising:

at least one treatment tank containing a solution:

first means for removing impurities floating on the surface of said solution; and



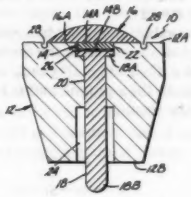
second means for withdrawing solution from said at least one tank and for removing particulate matter from said withdrawn solution.

4,549,951

ION SELECTIVE ELECTRODE

Mark B. Knudson, Arden Hills; Walter L. Sembrowich, and Vinodhini Guruswamy, both of Shoreview, all of Minn., assignors to SenTech Medical Corporation, Arden Hills, Minn.

Filed Sep. 11, 1984, Ser. No. 649,434
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—416 **22 Claims**



1. An ion selective electrode comprising:

a conductive electrode body having an essentially planar first surface A1 with an outer edge;

an insulating substrate supporting the electrode body and having an essentially planar first surface which surrounds and is essentially coplanar with the first surface of the electrode body; and

a convex dome-shaped ion selective membrane over the first surfaces of the electrode body and the insulating substrate; the membrane covering an area A2 which is greater than the area of the first surface of the electrode body and the membrane having an outer edge which is spaced laterally from and which is essentially coplanar with the outer edge of the first surface of the electrode body.

4,549,952

CAPILLARY TRANSPORT DEVICE HAVING MEANS FOR INCREASING THE VISCOSITY OF THE TRANSPORTED LIQUID

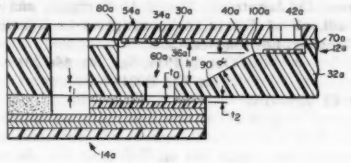
Richard L. Columbus, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 443,785, Nov. 22, 1982, abandoned. This application Oct. 3, 1983, Ser. No. 537,553
Int. Cl.[4] G01N *1/00, 27/28, 33/48*
U.S. Cl. 204—416 **21 Claims**

1. In a liquid transport device for simultaneously transporting two different aqueous liquids within a capillary passage, said device comprising two opposed liquid transport surfaces spaced apart a distance effective to induce capillary flow between said surfaces of introduced liquid and to create the capillary passage;

and access means, including two apertures, for respectively admitting said different liquids to said passage from the exterior of the device to two spaced-apart regions of the passage;

the improvement wherein there is disposed on at least one of said surfaces, spaced a capillary distance from the other surface, control means for (a) increasing the viscosity of the liquid while it is flowing past said at least one surface, and (b) at the same time maintaining such flow continuous within said passage,



whereby the rate of flow within said passage is reduced and any displacement force created when two liquids with unequal surface tensions meet within said passage, is countered.

4,549,953

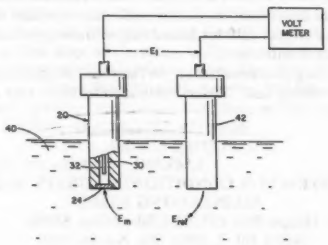
ION-SELECTIVE ELECTRODES

John N. Driscoll, Wellesley Hills, and Edwards S. Atwood, Natick, both of Mass., assignors to HNU Systems, Inc., Newton, Mass.

Continuation-in-part of Ser. No. 496,113, May 19, 1983, abandoned. This application Aug. 27, 1984, Ser. No. 644,772

Int. Cl.[4] G01N *27/30*; C01B *19/00, 17/00*

U.S. Cl. 204—419 **10 Claims**



3. An electrochemical cell comprising a reference electrode, an electrolyte, and an ion specific membrane, arranged to detect an ion in solution, said ion specific membrane comprising a ternary compound of Ag, S, and one of As, Sb, Se, or Te.

9. A method of making an ion specific membrane for use in an electrochemical cell comprising

combining an aqueous solution of a silver salt with an aqueous solution of a compound containing s and one of Se, Sb, Te, or As to form a precipitate containing Ag, S, and one of Se, Sb, Te, or As, and

subjecting said precipitate to elevated pressure at a temperature lower than 100° C. to form said membrane.

4,549,954

POWER RECOVERY SYSTEM FOR COAL LIQUEFACTION PROCESS

Joel R. Horton, Maryville, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 24, 1981, Ser. No. 257,032

Int. Cl.[4] C10G *1/00*

U.S. Cl. 208—8 LE **3 Claims**

1. A method for minimizing energy required for pumping a reactant into a reaction vessel wherein said reactant is reacted at high pressure to form a liquid product containing vaporizable constituents, comprising the following steps in the sequence set forth:

(1) introducing said reactant into a containment vessel;

(2) passing said liquid product, at essentially the pressure in said reaction vessel, from said reaction vessel into said containment vessel to thereby displace reactant from the containment vessel to a pumping means, pressurizing the reactant at said pumping means to a pressure higher than the pressure in said reaction vessel, and then passing the pressurized reactant from said pumping means into said reaction vessel;

(3) terminating flow of said liquid product from said reaction vessel into said containment vessel;

(4) discharging a portion of said liquid product from said containment vessel to thereby reduce pressure in the latter to a sufficiently low value to effect evolution of vaporizable constituents from liquid product remaining in the containment vessel;

(5) releasing the evolved constituents from said containment vessel; and

(6) sequentially repeating steps 1 through 5.

4,549,955

PROCESS FOR STABILIZING HYDROPROCESSED LUBRICATING OIL STOCKS BY THE ADDITION OF HYDROGEN SULFIDE

Stuart S. Shih, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 558,075, Dec. 5, 1983, abandoned, which is a continuation-in-part of Ser. No. 386,486, Jun. 9, 1982, abandoned. This application Nov. 30, 1984, Ser. No. 676,965

Int. Cl.[4] C10G *49/08, 47/16*

U.S. Cl. 208—59 **13 Claims**

1. In a method of processing a lube stock comprising (a) catalytic dewaxing of said lube stock in a catalytic dewaxing zone at temperatures ranging from about 204° to 427° C. (400° to 800° F.) and pressures ranging from at least about atmospheric, with a hydrogen-containing feed in the presence of a dewaxing catalyst comprising a shape-selective zeolite having a silica to alumina ratio of at least about 12, and a constraint index of about 1 to 12 and, (b) cascading the dewaxer effluent of the dewaxing step, including hydrogen-containing gaseous effluent, to a hydrotreating zone wherein said effluent is contacted with a conventional hydrotreating catalyst at temperatures ranging from about 204° to 427° C. (400° to 800° F.) and pressures ranging from about 100 to 3000 psig, the improvement which comprises enhancing oxidation stability of said lube stock by utilizing a hydrogen-containing feed to said dewaxing zone from said hydrotreating zone such that said feed contains about 0.5 to about 5 percent hydrogen sulfide by volume.

4,549,956

OCTANE AND TOTAL YIELD IMPROVEMENTS IN CATALYTIC CRACKING

Pochen Chu, West Deptford, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 587,415, Mar. 5, 1984, abandoned, which is a continuation-in-part of Ser. No. 434,442, Oct. 15, 1982, abandoned. This application Mar. 5, 1985, Ser. No. 708,111

Int. Cl.[4] C10G *11/05*

U.S. Cl. 208—120 **15 Claims**

1. In a process for catalytic cracking of a petroleum fraction having an initial boiling point of at least 400° F., a 50 percent boiling range of at least 500° F. and an end point range of at least 600° F. to produce motor fuels wherein said petroleum fraction is contacted at elevated temperatures of about 400° to about 1300° F. in the presence of a conventional cracking catalyst selected from a large pore size crystalline zeolite, silica-alumina, clays and mixtures thereof in admixture with an

additive catalyst comprising a zeolite component characterized by a constraint index of about 1–12 and a silica to alumina mole ratio greater than about 12, said additive catalyst being subjected to hydrothermal deactivation, the improvement wherein said zeolite component contains about 0.05 to about 5 weight percent silver based on said zeolite component.

4,549,957

HYDROTREATING CATALYST AND PROCESS

Albert L. Hensley, Jr., Munster, Ind., and Leonard M. Quick, Naperville, Ill., assignors to Amoco Corporation, Chicago, Ill.

Division of Ser. No. 274,500, Jun. 17, 1981,. This application Jun. 21, 1983, Ser. No. 506,293

The portion of the term of this patent subsequent to Sep. 30, 1997, has been disclaimed.

Int. Cl.[4] C10G *45/08, 45/20*

U.S. Cl. 208—216 PP **12 Claims**

1. A process for hydrotreating hydrocarbon feeds comprising contacting a hydrocarbon feed susceptible to upgrading with hydrogen under hydrotreating conditions in the presence of a catalyst comprising a hydrogenating component and a support comprising at least one porous refractory inorganic oxide, said catalyst having a BET surface area of 150 to about 190 m^2/g, a micropore volume of about 0.9 to about 1.3 cc/g as determined by nitrogen desorption in micropores having radii up to 600 Å, with at least 0.7 cc/g of such micropore volume in micropores with radii ranging from 50 to 600 Å, a macropore volume of 0.15 to about 0.5 cc/g as determined by mercury penetration in macropores having radii of 600 to 25,000 Å, a total pore volume of about 1.05 to about 1.8 cc/g being the sum of the aforesaid micropore volume and aforesaid macropore volume, and bulk density of about 0.3 to about 0.5 g/cc.

4,549,958

IMMOBILIZATION OF VANADIA DEPOSITED ON SORBENT MATERIALS DURING TREATMENT OF CARBO-METALLIC OILS

H. Wayne Beck, Russell; James D. Carruthers, Catlettsburg; Edward B. Cornelius, Ashland; William P. Hettinger, Jr., Russell; Stephen M. Kovach, Ashland; James L. Palmer, Flatwoods, and Oliver J. Zandona, Ashland, all of Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 277,752, Mar. 30, 1982, abandoned. This application Nov. 24, 1982, Ser. No. 444,275

Int. Cl.[4] C10G *25/00, 29/04, 29/16, 29/20*

U.S. Cl. 208—253 **46 Claims**

1. In a process for demetallizing and decarbonizing a residual hydrocarbon oil feed having a significant content of vanadium and Conradson carbon contributing material with fluidizable sorbent particle material in a progressive flow reaction zone to provide an oil product substantially lower in vanadium and Conradson carbon components and regenerating said sorbent under oxidizing conditions of temperatures causing formed vanadium pentoxide to melt and effect coalescence of fluid sorbent particles, the improvement which comprises:

A. contacting said oil feed with fluidizable sorbent particle material containing one or more additive metal components in an amount sufficient to complex with and immobilize the flow characteristics of vanadium pentoxide formed during sorbent regeneration, said additive metal component selected from one or more Mg, Ca, Ba, Sc, Y, La, Ti, Zr, Hf, Nb, Ta, Mn, In, Te, an element in the lanthanide or actinide series or an organo-metallic compound of said additive metal component;

B. removing deposited carbonaceous material from said sorbent comprising said additive metal component with an oxygen containing gas at an elevated combustion temperature;

C. complexing deposited vanadium with said additive metal components to form a complex having a melt temperature above the regeneration temperature, and

D. recycling said regenerated fluid sorbent particle material for contact with said hydrocarbon oil feed in a progressive flow reaction zone.

4,549,959

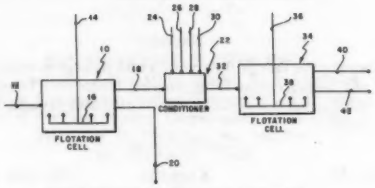
PROCESS FOR SEPARATING MOLYBDENITE FROM A MOLYBDENITE-CONTAINING COPPER SULFIDE CONCENTRATE

Raynor O. Armstrong; Daniel A. Norrgran, and William A. Yuill, all of Tucson, Ark., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 1, 1984, Ser. No. 656,201

Int. Cl.[4] B03D *1/14*

U.S. Cl. 209—167 **19 Claims**



1. A process for separating molybdenite from a molybdenite-containing copper sulfide concentrate by a flotation process wherein said molybdenite is selectively floated by use of a sulfite or bisulfite compound as a copper sulfide depressant, said process comprising:

(a) adjusting the pH of said concentrate to a value from about 3.0 to about 7.0 and the concentration of said copper sulfide depressant to a value sufficient to inhibit the flotation of copper sulfides in said concentrate upon aeration of said concentrate;

(b) aerating said concentrate to float said molybdenite; and,

(c) separating said floated molybdenite from said concentrate.

4,549,960

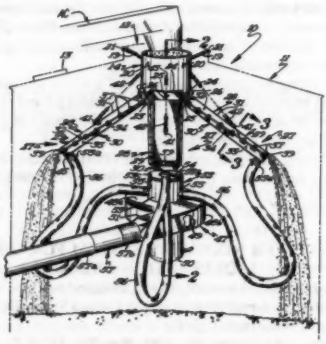
SYSTEM FOR CONDITIONING GRAIN AND MAINTAINING SAME

Gerald W. Hoppe, Box 157, St. Clair, Minn. 56080

Filed Jul. 7, 1983, Ser. No. 511,450

Int. Cl.[4] B07B *1/00*

U.S. Cl. 209—240 **11 Claims**



1. A portable, collapsible apparatus for cleaning grain delivered to a storage structure, comprising:

means mounted within sdid storage structure and adjacent an opening in the top of said grain storage structure for receiving grain therein to be cleaned, said receiving means

having discharge means through which grain is discharged;

a plurality of elongate, downwardly declined cleaning chutes, means connecting said chutes with said grain receiving means, each chute having an inlet at its upper end portion thereof positioned closely adjacent said receiving means, each chute having an elongate screen extending transversely of the chute throughout substantially the length thereof, said chute inlet being located above said screen for receiving grain from the receiving means, a grain outlet at the lower end of said chute located above said screen, a trash outlet at the lower end of said chute located below said screen, whereby grain passing through the inlet of the chute will be moved along the surface of the screen and will be discharged through the grain outlet into the storage structure, and trash and fine materials will pass through the screen and through the trash outlet;

a plurality of elongate delivery conduits, each having one end thereof adapted to be connected in communicating relation with said trash outlet;

a blower assembly, including a blower housing having a blower fan therein, and having a discharge outlet, means communicating the discharge outlet with the exterior of the storage bin, means connecting the other end of each of said delivery conduits with said blower assembly whereby when the blower fan is operated it will be capable of entraining said trash and fine materials in a stream of air and discharging them exteriorly of the grain storage structure.

4,549,961

APPARATUS FOR CLEANING FILTERS IN PRESSURIZED FLUID FLOW SYSTEMS

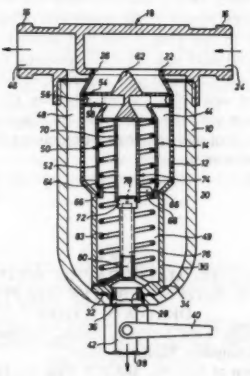
Rudolf Bellemann, St. Leon-Rot; Rolf Diehlmann, Lampertheim; Bela Dobrocsi, Weinheim, and Karl F. Wacker, Plankstadt, all of Fed. Rep. of Germany, assignors to Joh. A. Benckiser Wassertechnik GmbH, Schriesheim, Fed. Rep. of Germany

Filed Feb. 27, 1984, Ser. No. 584,099

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1983, 3307918; Aug. 13, 1983, 83108036

Int. Cl.[4] B01D *29/38*

U.S. Cl. 210—108 **19 Claims**



1. Filter apparatus with reverse flow cleaning, comprising,

unfiltered liquid inlet means receiving liquid under operating pressure;

a first chamber connected to said unfiltered liquid inlet means;

filtered liquid outlet means;

a second chamber connected to said filtered liquid outlet means;

filter means separating said first from said second chamber, said filter means having a first surface having a predetermined surface area exposed to unfiltered liquid and a second surface forming part of said second chamber, and including hollow cylindrical filter support means having a predetermined diameter and a hollow cylindrical filter supported thereby, said first and second chamber being, respectively, internal and external to said hollow cylindrical filter, whereby dirt particles collect on said first surface as a liquid flows from said first to said second chamber;

reverse flow means comprising reverse flow outlet means, externally operable reverse flow shut-off means having a first position allowing a reverse flow through said reverse flow outlet means and a second position stopping said reverse flow, and a reverse flow chamber adjoining said first chamber and connecting to said reverse flow outlet means;

channel means comprising reverse flow inlet means positioned adjacent to said first surface of said filter means to receive liquid flowing through said filter means from said second to said first chamber,

means interconnecting said reverse flow inlet means to said reverse flow chamber, said reverse flow chamber being internal to said hollow cylindrical filter support, said interconnecting means including a channel pipe having a diameter slightly smaller than the predetermined diameter of said hollow cylindrical filter support means, and a closed top for receiving said force created by said pressure difference, said channel pipe moving from said first to said reverse flow chamber as said inlet means moves from said first to said second position,

movement of said reverse flow shut-off means from said second to said first position creating a pressure difference causing a reverse flow from said second chamber through said filter means to said reverse flow inlet means, said pressure difference further creating a force acting on said reverse flow inlet means to move said reverse flow inlet means from a first end position over said first surface of said filter means to a second end position;

reset means moving said reverse flow inlet means back to said first end position following movement of said reverse flow shut-off means back to said second position, and

means for increasing said pressure difference after said reverse flow inlet means has moved from said first end position.

4,549,962

ROTATING BIOLOGICAL CONTACTOR

Lester M. Koelsch, Pewaukee, Wis., assignor to Envirex Inc., Waukesha, Wis.

Filed Jul. 19, 1984, Ser. No. 632,358

Int. Cl.[4] C02F *3/08*

U.S. Cl. 210—150 **7 Claims**

1. A rotating biological contactor comprising:

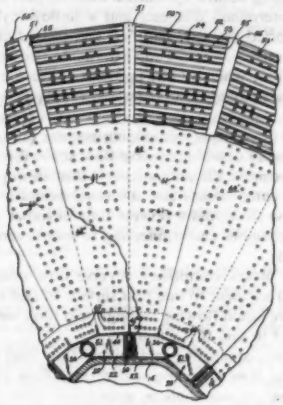
a polygonal shaft;

a plurality of adjacent polymeric hub rings disposed side by side and surrounding said shaft, each of said hub rings comprising a plurality of identical hub segments joined end to end by welding and each hub segment having an inner profile which complements the contour of the shaft and a mounting portion extending radially outwardly of each of said hub rings;

each of said hub segments further having a wall extending in a plane normal to the axis of the shaft, and a projection extending from the wall of each hub segment and welded to the wall of a hub segment of an adjacent hub ring;

polymeric contactor media welded to said mounting portion of each of said hub segments about the perimeter of each of said hub rings, and the contactor media of each hub ring

being welded to the contactor media of an adjacent hub ring to form an integrated unit, said contactor media



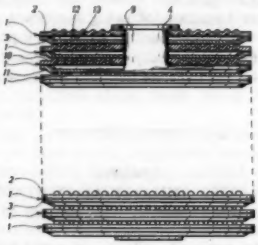
defining a series of passageways through which wastewater to be treated can pass.

4,549,963

FILTERING DEVICE COMPRISING ONE OR MORE FILTERING ELEMENTS CONSISTING OF FILTERING DISCS

Carl A. Jensen, and Ib O. Rasmussen, both of Svendborg, Denmark, assignors to C. C. Jensen A/S, Svendborg, Denmark

Filed Aug. 15, 1983, Ser. No. 523,057
Claims priority, application Denmark, Aug. 26, 1982, 3821/82
Int. Cl.⁴ B01D *29/06, 29/34*
U.S. Cl. 210—314 **2 Claims**



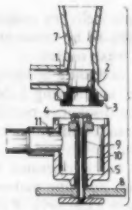
1. A filtering device comprising at least one filtering element, the filtering element comprising first and second identical filter discs joined at their peripheral edges, the filter discs having a series of parallel corrugations, means defining an aperture extending through the center of the discs for the passage of fluid, said parallel corrugations forming fluid flow channels in communication with said aperture, a first annular plane area around each of the apertures and defining the outer face of the filter disc, and a second annular plane area at the periphery on the inner face of each of the filter discs, the two discs joined together with the second annular plane areas abutting each other such that the first annular plane areas face outward from the filter element and the corrugations of the first disc are situated such that they intersect the corrugations of the second disc, the corrugations of each disc having crests which lie in substantially the same plane as the first annular plane area, the corrugations further having troughs located substantially in the same plane as the second annular plane area, the filter element capable of being joined with a second filter element having the first annular plane areas abutting each other.

4,549,964

DEVICE FOR FLUSHING OBSTRUCTIONS FROM THE REJECT HEAD OF A CENTRIFUGAL SEPARATOR

Pentti Vikiö, Savonlinna, Finland, assignor to Enso-Gutzeit Oy, Helsinke, Finland

Filed Jun. 2, 1983, Ser. No. 500,207
Claims priority, application Finland, Jun. 3, 1982, 821971
Int. Cl.⁴ B01D *35/16*
U.S. Cl. 210—369 **3 Claims**



1. In a centrifugal separator having an upwardly extending reject end with an open lower end, a removable plug closing the lower end of said reject end, a reject outlet located adjacent the lower end of said reject end, wherein the improvement comprises an opening device including a chamber having an upper end, a lower end and side walls laterally defining the chamber with the bottom end being closed and the upper end being open, a discharge orifice located in said side walls, a quick locking device located at the upper end of said chamber for removably securing said opening device to the lower end of said reject end, a tube positioned within said chamber extending through the bottom end of said chamber, said tube having an upper end located within said chamber and a lower end located exteriorly of said chamber, said tube being displaceable in said chamber, means on the upper end of said tube for locking said tube to said plug, a rod unit located within said tube and engageable with said plug for retaining said plug on said tube so that said tube and pipe can remove said plug from the lower end of said reject outlet whereby the chamber is in communication with the interior of said reject end through the open upper end of said chamber for receiving impurities blocking said reject outlet.

4,549,965

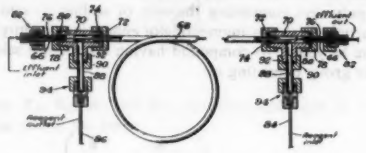
LIQUID CHROMATOGRAPHIC METHOD AND APPARATUS WITH MEMBRANE FOR POST-COLUMN DERIVATIZATION

James C. Davis, East Lansing, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 465,977, Feb. 14, 1983, Pat. No. 4,448,691. This application Jan. 13, 1984, Ser. No. 570,562
The portion of the term of this patent subsequent to May 15, 2001, has been disclaimed.
Int. Cl.⁴ B01D *15/08*
U.S. Cl. 210—635 **3 Claims**

1. Method of analyzing samples by flow injection comprising adding sample to a stream of eluent, whereby dispersed sample species appear ultimately in the effluent, the improvement which comprises, feeding the effluent through the internal bore of a hollow fiber membrane, ultimately to a liquid

chromatographic detector, and prior to detection, using the hollow fiber membrane for permeation transfer of a mobile



reagent into the effluent of the chromatographic column means to enhance the sensitivity of detection of the method.

4,549,966

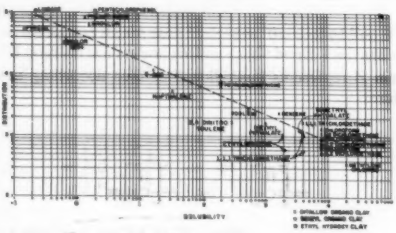
METHOD OF REMOVING ORGANIC CONTAMINANTS FROM AQUEOUS COMPOSITIONS

Gary W. Beall, Austin, Tex., assignor to Radecca, Inc., Austin, Tex.

Continuation of Ser. No. 419,301, Sep. 20, 1982, abandoned, which is a continuation-in-part of Ser. No. 307,300, Sep. 30, 1981, abandoned. This application Jun. 8, 1984, Ser. No. 618,544

Int. Cl.⁴ C02F *1/28*

U.S. Cl. 210—661 **22 Claims**



1. A method of removing organic contaminants from an aqueous composition contaminated therewith, comprising:

(a) contacting an aqueous composition containing organic contaminants selected from the group consisting of substantially water insoluble organic contaminants, aliphatic contaminants, humics and mixtures of the same with a sufficient amount of an organoclay which is the previously prepared reaction product of a quaternary amononium salt and a smectite-type clay, for a sufficient amount of time to adsorb a substantial portion of contaminant and to form an aqueous organoclay admixture; and

(b) separating the organoclay and aqueous composition from each other.

4,549,967

FLOCCULANT COMPOSITION

Merle L. Branning, Warrenville, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Continuation of Ser. No. 397,061, Jul. 12, 1982, abandoned. This application Mar. 15, 1984, Ser. No. 589,848

Int. Cl.⁴ C02F *1/56*

U.S. Cl. 210—728 **7 Claims**

1. In a process for improving the flocculation activity of water-soluble anionic vinyl polymers used to flocculate suspended materials from aqueous systems, which aqueous systems also contain amounts of polyvalent metal ions adverse to the viscosity, rheology, and flocculating capabilities of the polymer, the improvement which comprises performing the process in the presence of an alkali metal salt selected from the group consisting of alkali metal tetraborates, permanganates, tribasic phosphates and silicates, and alkali metal salt being present in an amount of from about 5 to about 35 weight percent based on monomer when added prior to polymerization and from about 0.5 to about 10% by weight based on the weight of the polymer when added after polymerization, whereby said alkali metal salt does not substantially hydrolyze said anionic vinyl polymer.

4,549,968

METHOD OF UTILIZING IMPROVED STABILITY OXYGEN SCAVENGER COMPOSITIONS

John A. Muccitelli, Elkins Park, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed May 18, 1984, Ser. No. 611,647

Int. Cl.⁴ C02F *1/20*

U.S. Cl. 210—750 **14 Claims**

1. A method for reducing the amount of oxygen in an aqueous medium, comprising adding to said medium an effective amount for the purpose of a treatment comprising a stable solution of (a) hydroquinone, (b) mu-amine and (c) a member selected from the group consisting of isoascorbic acid, ascorbic acid and water soluble salt forms thereof, the weight ratio of (a):(b):(c) being within the range of 1:0.02–2.0:0.05–2.5, said stable solution being adapted for storage without resulting in substantial sludge formation therein.

4,549,969

PROCESS AND AN APPARATUS FOR ENRICHING LIQUIDS WITH OXYGEN

Klaus Gerlach, Aschaffenburg; Wolfgang Lange, Obernburg, and Dieter Loh, Erlenbach, all of Fed. Rep. of Germany, assignors to Akzo NV, Arnhem, Netherlands

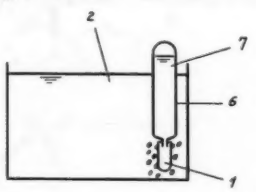
Continuation-in-part of Ser. No. 313,755, Oct. 22, 1981, Pat. No. 4,440,648. This application Jan. 16, 1984, Ser. No. 571,514

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1980, 3042281

The portion of the term of this patent subsequent to Apr. 3, 2001, has been disclaimed.

Int. Cl.⁴ C02F *1/72*

U.S. Cl. 210—759 **8 Claims**

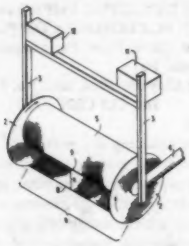


1. A process for enriching a liquid with oxygen by means of a catalyst and a liquid which gives off oxygen under the effect of that catalyst, comprising introducing an an approximately 0.1 to 5% hydrogen peroxide solution into a container, immersing said container, closed with a porous molding in the pores of which is incorporated as catalyst manganese dioxide, Fe_2O_3 and/or nickel oxide, into said liquid to be enriched with oxygen so that at least the entire porous molding is immersed, and allowing the hydrogen peroxide to pass through the porous molding under the effect of excess pressure building up in said container through the formation of oxygen therein, so that again oxygen is given off by said hydrogen peroxide, which oxygen for the most part is fed to the liquid to be enriched with oxygen.

4,549,970
METHOD FOR COLLECTING AND SEPARATING SOLIDS AND/OR INSOLUBLE LIQUIDS FROM A LIQUID BODY

Kenneth Ek, Pl. 6148 Hagby, 388 00 Ljungbyholm, and Ulf Hammarstedt, Traktörsgränd 6, 393 64, Kalmar, both of Sweden

Filed Jun. 24, 1983, Ser. No. 507,622
Int. Cl.⁴ E02B *15/04*
U.S. Cl. 210—776 **6 Claims**



1. A method of mechanically collecting and separating solids and/or insoluble liquids from a liquid body by the use of a collector wheel which is supported for rotation about an axis, said collector wheel being located in said liquid body and comprising a sheet of mesh material having openings therein, said sheet having a leading edge, a trailing edge and opposed side edges, said sheet being spaced from said axis by distances which decrease progressively from said leading edge to said trailing edge so that the axis is closer to the trailing edge than to the leading edge, opposed end panels located at the side edges of said sheet, a receptacle located on said axis and having an upwardly facing opening, said receptacle having an exterior surface which is wiped by said trailing edge of the sheet during rotation of the collector wheel, and means for discharging material which is collected in the receptacle,

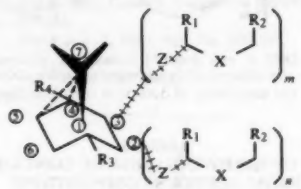
said method being performed by rotating said collector wheel in said liquid body about said axis in a direction toward said leading edge to collect said solids or insoluble liquids in said body, said rotation of the collector wheel creating a turbulent zone near the mesh to prevent solids or insoluble liquids from escaping from the interior of the wheel.

4,549,971
METHYL SUBSTITUTED PINYL OXOPENTENES, ORGANOLEPTIC USES THEREOF AND PROCESS FOR PREPARING SAME

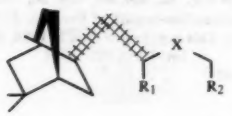
Braja D. Mookherjee, Holmdel; Robert W. Trenkle, Bricktown; Robin K. Wolff, Point Pleasant; Richard M. Boden, Ocean, and Takao Yoshida, West Long Branch, all of N.J., assignors to International Flavors & Fragrances, Inc., New York, N.Y.

Division of Ser. No. 496,679, May 20, 1983, , which is a division of Ser. No. 396,485, Jul. 9, 1982, Pat. No. 4,424,378, which is a continuation-in-part of Ser. No. 362,237, Mar. 26, 1982, Pat. No. 4,428,387. This application May 24, 1984, Ser. No. 613,564
Int. Cl.⁴ C07C *49/21*; C11D *3/50, 9/44*
U.S. Cl. 252—8.6 **3 Claims**

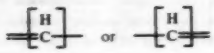
1. A process for augmenting or enhancing the aroma of a perfumed article selected from the group consisting of solid or liquid anionic, cationic, nonionic or zwitterionic detergents, fabric softener compositions, fabric softener articles and perfumed polymers comprising the step of adding to said perfumed article an aroma augmenting or enhancing quantity of at least one bicyclic oxo compound having a structure selected from the group consisting of:



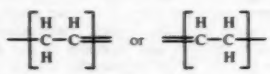
and



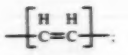
wherein Z represents methylidene defined according to the structure:



ethylidene defined according to the structure:



or ethylenyl defined according to the structure:



wherein one of the dashed lines represents a carbon-carbon single bond and the other of the dashed lines represents no bond; wherein n is 0 or 1 and m is 0 or 1 with the sum of n + m being equal to 1; wherein X represents carbinol having the structure:

or ketone having the structure:

wherein R_1, R_2, R_3 and R_4 represent hydrogen or methyl wherein one of the lines:

+ + + +

represents a carbon-carbon single bond and the other of the lines:

+ + + +

represents a carbon-carbobn single bond or a carbon-carbon double bond; wherein one of the lines:

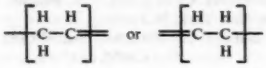
/+/+/+/+/+/

represents a carbon-carbon single bond and the other of the lines:

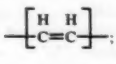
/+/+/+/+/+/

represents a carbon-carbon single bond or a carbon-carbon double bond; with the provisos that:

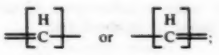
(i) when R_3 and R_4 are each hydrogen, the dashed line at the 7-5 position is a carbon-carbon single bond; n=0 and m is 1; Z represents ethylidene having the structure:



or ethylenyl having the structure:



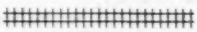
(ii) when one of R_3 or R_4 is methyl, then either the dashed line at the 7-5 position or the dashed line at the 7-4 position is a carbon-carbon single bond; and Z represents methylidene defined according to the structure:



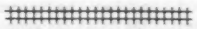
(iii) when R_3 is methyl, then n is 1 and m is 0 and R_4 is hydrogen; and

(iv) when R_4 is methyl, then R_3 is hydrogen, n is 0 and m is 1

wherein one of the lines:

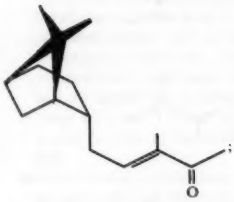


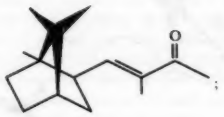
is a carbon-carbon double bond and the other of the lines:

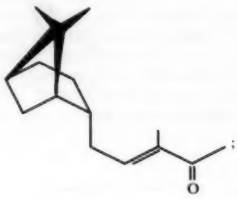


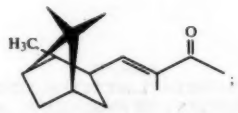
is a carbon-carbon single bond.

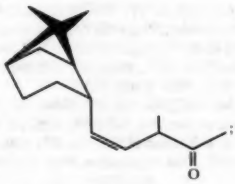
2. The process of claim 1 wherein the bicyclic oxo compound has a structure selected from the group consisting of compounds having the structures:

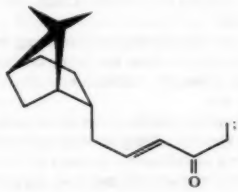




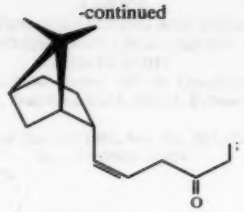


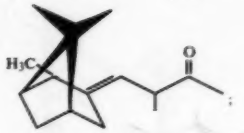




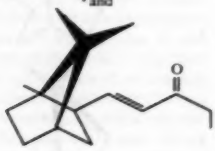


-continued





and



4,549,972

1,2,3,3,5,6-HEXAMETHYL-BICYCLO[2.2.2]OCT-5-EN-2-OL, PROCESS FOR PRODUCING SAME, INTERMEDIATES USEFUL IN SAID PROCESS AND ORGANOLEPTIC USES OF SAME

William J. Evers, Locust; Braja D. Mookherjee, Holmdel; Anton Van Ouwerkerk, Livingston, all of N.J., and Augustinus G. Van Loveren, Rye, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 602,569, Apr. 20, 1984, Pat. No. 4,514,324, which is a division of Ser. No. 535,800, Sep. 26, 1983, Pat. No. 4,471,135, which is a division of Ser. No. 371,930, Apr. 26, 1982, Pat. No. 4,434,085. This application Nov. 14, 1984, Ser. No. 671,406

Int. Cl.[4] **C07C** *35/22, 35/31;* **C11D** *3/50, 9/44*

U.S. Cl. 252—8.6 **3 Claims**

1. A process for augmenting or enhancing the aroma of a perfumed article selected from the group consisting of:

(i) solid or liquid anionic, cationic, nonionic or zwitterionic detergents; and

(ii) fabric softener compositions or fabric softener articles

comprising the step of adding to said perfumed article, an aroma augmenting or enhancing quantity of at least one compound having the structure selected from the group consisting of:

and

4,549,973

DECOLORIZATION OF CALCIUM BROMIDE BRINES

Warren B. Kirsch, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Apr. 25, 1983, Ser. No. 488,159

The portion of the term of this patent subsequent to Sep. 18, 2001, has been disclaimed.

Int. Cl.[4] **C09K** *7/00*

U.S. Cl. 252—8.55 R **7 Claims**

5. A process for removing or decreasing color from a high density brine used in oil wells, said brine containing at least one salt selected from the group consisting of calcium chloride, calcium bromide, zinc chloride, zinc bromide, sodium chloride, sodium bromide, potassium chloride, potassium bromide and mixtures thereof, said process comprising: adding to said brine a decolorizing agent selected from the group consisting of hydroxylamine as either the pure compound, a salt, or the hydrate, in a sufficient amount to remove or decrease the amount of color present in said brine.

4,549,974

LUBRICANTS CONTAINING SULFURIZED ORGANIC ACID DIAMINE SALTS

Andrew G. Horodysky, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 23, 1983, Ser. No. 535,132

Int. Cl.[4] **C10M** *1/32*

U.S. Cl. 252—33.6 **25 Claims**

1. An acid-amine salt prepared by reacting a sulfurized carboxylic acid of the formula

$$R—COOH$$

wherein R is a C_{10} to C_{20} unsaturated hydrocarbyl group, at from about 20° C. to about 120° C., with a diamine of the formula

$$R^2—N(R^3)—R^1—NHR^3$$

wherein R^1 is a C_2 to C_4 hydrocarbylene group, R^2 is a C_{12} to C_{30} hydrocarbyl group and R^3 is hydrogen or a C_1 to C_6 hydrocarbyl group, using a molar ratio of sulfurized acid to diamine of from about 1:1 to about 4:1.

4,549,975

BORATED ADDUCTS OF DIAMINES AND ALKOXIDES, AS MULTIFUNCTIONAL LUBRICANT ADDITIVES, AND COMPOSITIONS THEREOF

Andrew G. Horodysky, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 27, 1983, Ser. No. 566,083

Int. Cl.[4] **C10M** *1/54*

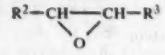
U.S. Cl. 252—49.6 **20 Claims**

1. A reaction product produced by (1) reacting a diamine or mixtures thereof having the following general formula

$$R—NH—R'—NH_2$$

where R is C_8 to C_{20} hydrocarbyl or hydrocarbyloxy and R' is C_2–C_4 hydrocarbylene with an alkoxide or mixtures thereof

wherein said alkoxide is an epoxyalkane alkoxide having the following general formula



where R^2 is C_6 to C_{20} hydrocarbyl and R^3 is hydrogen or C_1–C_6 hydrocarbyl and a C_1–C_8 carboxylic acid followed by (2) borating the product thereof or concurrently reacting the product of (1) with said acid and with substantially stoichiometric amounts of up to a 100% excess of a boron compound selected from the group consisting essentially of a boric acid and a trialkyl borate.

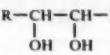
4,549,976

LUBRICANT COMPOSITION CONTAINING REACTION PRODUCTS OF VICINAL DIOLS AND PHOSPHORUS OXYHALIDES

Andrew G. Horodysky, Cherry Hill, and Phillip S. Landis, Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 6, 1983, Ser. No. 539,498
Int. Cl.[4] C10M *1/44*
U.S. Cl. 252—49.8 **20 Claims**

1. A product of reaction obtained by reacting (1) a mixture of hydrocarbyl vicinal diols of the formula



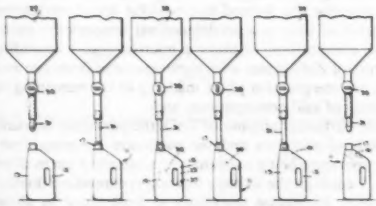
wherein R is hydrogen or a hydrocarbyl group containing 12 to 18 carbon atoms, at least one R being a hydrocarbyl group, with (2) a phosphorus oxyhalide said reaction being carried out at a temperature between about 60° C. and about 225° C., and a mole ratio of diol to phosphorus oxyhalide of between about 4:1 and about 2:1.

4,549,977

BOTTLED PARTICULATE DETERGENT

David Joshi, Piscataway, N.J., and Richard Klingaman, Houston, Tex., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 338,546, Jan. 11, 1982, Pat. No. 4,444,673, which is a division of Ser. No. 171,325, Jul. 23, 1980, Pat. No. 4,351,740, which is a continuation of Ser. No. 964,037, Dec. 21, 1978, Pat. No. 4,269,722, which is a continuation-in-part of Ser. No. 727,838, Sep. 29, 1976, abandoned. This application Jan. 16, 1984, Ser. No. 571,118
Int. Cl.[4] C11D *17/06*
U.S. Cl. 252—90 **14 Claims**



1. A method for washing soiled laundry, which comprises:

pouring into a container an effective amount of a bottled, free flowing particulate laundry detergent from a transparent bottle having a neck portion for dispensing detergent from the bottle;

adding the effective amount of the particulate laundry detergent in the container to wash water containing the soiled laundry thereby forming a washing mixture;

agitating the washing mixture until the soiled laundry is cleaned;

the transparent bottle being made of a thin-walled synthetic organic polymeric plastic which is essentially moisture proof, the neck being located at the top of the bottle and having a passageway therethrough with a cross-sectional area of less than 40% of the average cross-sectional area of the bottle, wherein the neck passageway has a cross-sectional area of about from 2 to 40 sq. cm., the bottle being provided further with an integral hollow handle located on the side of the bottle, wherein the interior of the handle communicates with other interior portions of the bottle, and the handle has an internal cross-sectional area in the range of about 1 to 10 sq. cm., the neck being located nearer the side of the bottle opposite that of the handle; and

the free-flowing particulate detergent in said bottle being pourable through the neck and handle and having a composition comprising from about 2 to 50% by weight of a synthetic organic detergent selected from the group consisting of nonionic detergents and mixtures of the nonionic detergents with anionic detergents, wherein said nonionic detergent is a normally tacky ethoxylated detergent, and from about 50 to 90% by weight of builders for the detergent, wherein the builders are selected from the group consisting of ion exchanging clays, organic builders and sodium salts of at least one of bicarbonates, borates, carbonates, phosphates, and silicates; the particles being sized such that at least 90% thereof pass through an 8 mesh screen and are retained on a 200 mesh screen (U.S. Sieve Series), are of a bulk density of at least 0.5 g/cc., are of a flowability sufficiently high so that the particulate detergent flows through the neck and handle of the bottle, and are substantially dust-free so that after pouring some of the composition from said bottle, the bottle and the contained volume above the level of the particulate detergent return to a transparent condition, and resealable cap for the neck portion.

4,549,978

PROCESS FOR MANUFACTURE OF DETERGENT POWDER

Elfed H. Evans, Clwys, Wales; Klaus Hirte, Buxtehude, and Gerd Stremmel, Brühl, both of Fed. Rep. of Germany, assignors to Lever Brothers Company, New York, N.Y.

Filed Oct. 25, 1984, Ser. No. 664,661
Claims priority, application United Kingdom, Oct. 26, 1983, 8328646; Nov. 11, 1983, 8330199
Int. Cl.[4] C11D *11/02*
U.S. Cl. 252—109 **8 Claims**

1. A process for the manufacture of a detergent powder containing a heat-sensitive component which comprises:

(a) forming a first aqueous crutcher slurry and spraying it from a first upper level downwardly into a spray-drying tower;

(b) passing drying gas into the spray-drying tower from a second lower level;

(c) forming a second aqueous slurry and spraying it into the spray-drying tower at a third level, lower than the second slurry;

characterised in that the heat-sensitive component is incorporated in the second slurry.

4,549,979
DETERGENT COMPOSITION WITH SILICONATE-SILICATE COPOLYMER

Grish Chandra; Jeffrey A. Kosal, both of Midland; Lenin J. Petroff, Bay City, and Edwin P. Plueddemann, Midland, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Mar. 27, 1984, Ser. No. 593,750
Int. Cl.[4] C11D 7/14
U.S. Cl. 252—135 **19 Claims**

1. A detergent composition comprising

(A) 5 to 50 parts by weight of an organic surfactant selected from the group consisting of anionic, nonionic and ampholytic surfactants, and

(B) 1 to 50 parts by weight of a siliconate-silicate product comprising

(a) 50 to 100 parts by weight of silicate units represented generally by the formula

$$(MO)_nSiO_{(4-n)/2}$$

wherein M is hydrogen or alkali metal and n has an average value from 0.5 to 3 and

(b) 0.1 to 100 parts by weight of siliconate units represented generally by the formula

$$(MO)_aO_{(3-a)/2}Si—R—Y_b$$

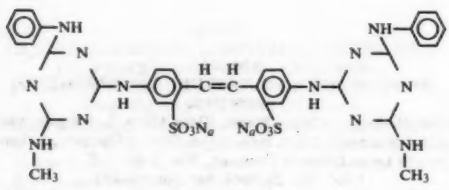
wherein Y represents an anionic functional group, R is an organic linking group wherein Y is positioned at least 2 carbon atoms removed from the silicon atom, b is an integer from 1 to 3, a has a value of from 0.5 to 2, and M is hydrogen or alkali metal.

4,549,980
WHITE MODIFICATION OF A BIS-TRIAZINYL AMINO STILBENE OPTICAL BRIGHTENER AND A PROCESS FOR MAKING THE SAME

Susan M. Morris, John's Island; Thomas J. Thomas, and Dietmar Kalz, both of Summerville, all of S.C., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Oct. 11, 1983, Ser. No. 540,748
Int. Cl.[4] C07D 251/54; C09K 11/06; C11D 3/42; D06L 3/12
U.S. Cl. 252—301.23 **13 Claims**

1. A new crystal form of the sodium salt form of the optical brightener having the following structure



said crystal form being characterized by Debye-Scherrer X-ray diffraction pattern reflections of the following relative intensities representative of the following d-spacings:

Relative Intensity	d-Spacing (in Å)
Fairly strong	8.18–8.35
Fairly strong	7.14–7.25
Fairly strong	5.22–5.28
Strong	4.72–4.80
Weak	4.57–4.58
Fairly strong	3.53–3.59
Moderate	3.38–3.40

6. A process for obtaining a crystalline form of sodium-4,4'-bis-(2-amino-4-phenylamino-1,3,5-triazinyl-6-amino)-stilbene-2,2'-disulphonate which is white on drying from an aqueous slurry at 75° C. or less and displays fairly strong to strong Debye-Scherrer X-ray diffraction pattern reflections representative of d-spacings at 8.18–8.35, 7.14–7.25, 5.22–5.28, 4.72–4.80 and 3.53–3.59 angstroms comprising the steps of:

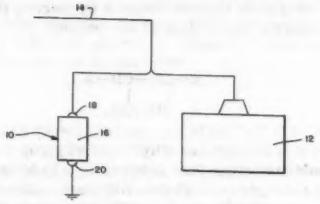
(a) heating an aqueous slurry containing an electrolyte and at least some of this compound in undissolved form at a temperature above about 60° C.; and

(b) spray drying this slurry to obtain the compound and electrolyte as a dry powder.

4,549,981
VOLTAGE LIMITING COMPOSITION AND METHOD OF FABRICATING THE SAME

Tapan K. Gupta, Monroeville; William G. Carlson, Murrysville, both of Pa.; Joseph C. Osterhout, Bloomington, Ind.; Gerald B. Boyette, Bloomington, Ind., and Andrew S. Sweetana, Jr., Bloomington, Ind., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Continuation of Ser. No. 115,448, Jan. 25, 1980, abandoned, which is a continuation of Ser. No. 896,349, Apr. 14, 1978, abandoned. This application Sep. 17, 1982, Ser. No. 419,160
Int. Cl.[4] H01B 1/06
U.S. Cl. 252—518 **8 Claims**



1. A method of fabricating a voltage limiter especially suitable for use in gapless lightning arresters, said method comprising:

(a) preparing a composition which is selected to consist essentially of the following ingredients by approximate mole %:

ZnO	93.5
Bi_2O_3	3.0
Co_3O_4	1.0
M_nO_2	1.0
Sb_2O_3	1.0
SiO_2	0.5

(b) forming the composition into the desired shape;

(c) sintering the formed composition for a predetermined period of time at a predetermined temperature such that the composition displays a microstructure including an array of ZnO grains which are separated from one another by an intergranular phase made up of the remaining ingredients of said compositions; and

(d) the particular amount of ZnO, the particular amount and kinds of additives and the particular sintering time and temperature being such that for a sample 5 cm in diameter by 1 cm high the voltage limiting composition displays an energy absorption capability at least equal to about 50 joules/cm^3 and a nonlinear exponent α at least equal to about 35 as determined by the following equation for α:

$$\alpha = \frac{\log 10\,(I_2/I_1)}{\log 10\,(V_2/V_1)}$$

where V_1 and V_2 are the respective voltages across said sample at currents I_1 and I_2 flowing therethrough and where I_1 and I_2 are 1 ma and 5000 amps, respectively.

2. A voltage llimiting composition especially suitable for use in a gapless lightning arrester, said composition consisting of the following ingredients by approximate mole %:

ZnO	93.5
Bi_2O_3	3.0
Co_3O_4	1.0
M_nO_2	1.0
Sb_2O_3	1.0
SiO_2	0.5

said composition displaying a microstructure including an array of ZnO grains which are separated from one another by an intergranular phase made up of the remaining ingredients of said composition and being sintered such that for a sample 5 cm in diameter by 1 cm high it displays an energy absorption capability at least equal to about 50 joules/cm^3 and a nonlinear exponent α at least equal to about 35 as determined by the following equation for α:

$$\alpha = \frac{\log 10\ (I_2/I_1)}{\log 10\ (V_2/V_1)}$$

where V_1 and V_2 are the respective voltages across said sample at currents I_1 and I_2 flowing therethrough and where I_1 and I_2 are 1 ma and 500 amps, respectively.

4,549,982

1-OXOALKYL-2-ISOPROPYLNORBORNANE DERIVATIVES, USES THEREOF IN AUGMENTING OR ENHANCING THE AROMA OF CONSUMABLE MATERIALS AND PROCESSES FOR PREPARING SAME

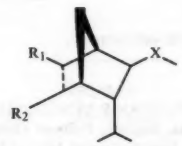
John B. Hall, Rumson; Mark A. Sprecker, Sea Bright; Robert P. Belko, Woodbridge, all of N.J.; Augustinus G. Van Loveren, Rye, N.Y., and Marie R. Hanna, Hazlet, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Aug. 24, 1984, Ser. No. 644,058

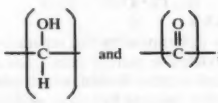
Int. Cl.[4] **C07C** *49/115;* **A61K** *7/46*

U.S. Cl. 252—522 R **13 Claims**

1. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, colognes and perfumed articles comprising the step of adding to said consumable material, an aroma augmenting or enhancing quantity of at least one 1-oxoalkyl-2-isopropylnorbornane derivative defined according to the structure:

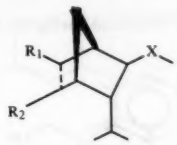


wherein X represents a moiety selected from the group consisting of:

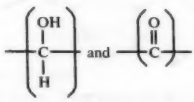


wherein the dashed line represents a carbon-carbon double bond or a carbon-carbon single bond and wherein R_1 and R_2 represent hydrogen or methyl with the proviso that R_1 and R_2 are not both methyl.

7. An 1-oxoalkyl-2-isopropylnorbornane derivative defined according to the structure:



wherein the dashed line represents a carbon-carbon double bond or a carbon-carbon single bond; wherein X represents a moiety having a structure selected from the group consisting of:



and wherein R_1 and R_2 each represent hydrogen or methyl with the provisos:

(a) that R_1 and R_2 are not both methyl;

(b) that R_1 and R_2 are not both hydrogen when the dashed line is a double bond and X is the moiety:

4,549,983

PROCESS FOR PREPARING PHENYL ALKANOL AND PERFUMERY USES OF RESULTING PRODUCT

Wilhelmus J. Wiegers, Red Bank, and Mark A. Sprecker, Sea Bright, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

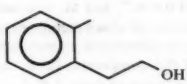
Continuation-in-part of Ser. No. 482,823, Apr. 7, 1983, Pat. No. 4,512,918. This application Mar. 14, 1984, Ser. No. 589,472

The portion of the term of this patent subsequent to Apr. 23, 2002, has been disclaimed.

Int. Cl.[4] **C11B** *9/00*

U.S. Cl. 252—522 R **8 Claims**

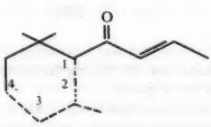
1. A composition of matter comprising a substantially pure compound having the structure:



and intimately admixed therewith at least one compound selected from the group consisting of:

(a) 3-methyl-1-phenyl-pentanol-5; and

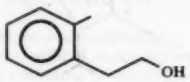
(b) at least one butanoyl cyclohexane derivative defined according to the structure:



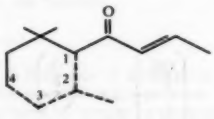
wherein one or two of the dashed lines represent carbon-

carbon double bonds and the other of the dashed lines represent carbon-carbon single bonds with the proviso that when the dashed lines represent two carbon-carbon double bonds, said carbon-carbon double bonds are conjugated,

the mole ratio of of compound having the structure:



:butanoyl cyclohexane derivative having the generic structure:



and/or 3-methyl-1-phenyl-pentanol-5 being from about 0.01:1 up to about 1:1.

4,549,984

LIQUID DETERGENT COMPOSITION

Teruhisa Satsuki, Funabashi, and Seiiti Ota, Chiba, both of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Apr. 9, 1984, Ser. No. 597,894

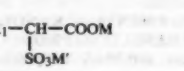
Claims priority, application Japan, Jun. 30, 1983, 58-116989

Int. Cl.⁴ C11D *1/12, 1/37*

U.S. Cl. 252—532 **5 Claims**

1. An aqueous liquid detergent composition comprising:

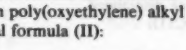
(a) disalt of an alpha-sulfonated fatty acid having the general formula (I):



(I)

wherein R_1 is an alkyl or alkenyl group having 8 to 16 carbon atoms and M and M' are independently a cation capable of forming a water-soluble salt selected from the group consisting of substituted and unsubstituted ammonium groups; and

(b) an poly(oxyethylene) alkyl ether sulfate having the general formula (II):



(II)

wherein R_2 is an alkyl group having 9 to 15 carbon atoms, n is a number of 0.5 to 7, and M" is a cation selected from the group consisting of alkali metals, alkaline earth metals, substituted and unsubstituted ammonium groups, and the weight ratio of the component (a) to the component (b) being within the range of from $\frac{1}{4}$ to $\frac{1}{1}$.

4,549,985

WASTE DISPOSAL PROCESS

Henry H. Elliott, Pleasanton, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Jun. 7, 1982, Ser. No. 385,785

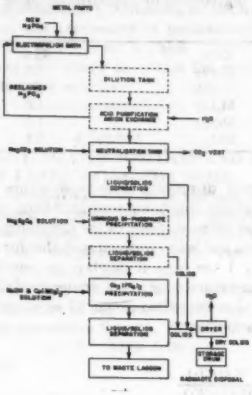
Int. Cl.⁴ G21F *9/04;* **B01D** *11/00*

U.S. Cl. 252—631 **33 Claims**

1. A method for solidifying and separating constituents from phosphoric acid solutions containing uranium and dissolved metals, comprising the steps of:

(a) adding an alkali metal carbonate to a solution of phosphoric acid containing uranium and dissolved metals in at least about stoichiometric proportions to the acid content of the solution, and separating precipitated insolubles therefrom;

(b) adding a calcium salt to the solution in amount of about 10 to about 50 percent in excess of stoichiometric proportions with the phosphate content; and



(c) adding an alkali metal hydroxide to the solution and adjusting the pH of said solution to at least about 10, and separating precipitated insolubles therefrom.

4,549,986

HUMAN CGRP

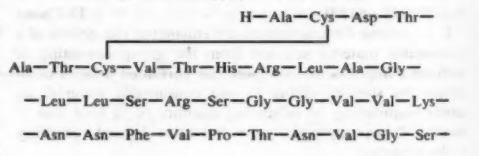
Ronald M. Evans, La Jolla, and Michael G. Rosenfeld, San Diego, both of Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Filed Dec. 23, 1983, Ser. No. 565,035

Int. Cl.⁴ C07C *103/52*

U.S. Cl. 260—112.5 T **5 Claims**

1. A composition of matter in the form of a synthetic peptide having the formula:



or a nontoxic addition salt thereof.

4,549,987

ASPARTAME SYNTHESIS

Franco Dallatomasina, Segrate; Roberto Ortica, Rozzano; Pietro Giardino, and Ernesto Oppici, both of Milan, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

Filed Aug. 6, 1984, Ser. No. 637,786

Claims priority, application United Kingdom, Aug. 12, 1983, 8321802

Int. Cl.⁴ C07C *103/52*

U.S. Cl. 260—112.5 R **9 Claims**

1. A process for deformylating and separating N-formyl-L-α-aspartyl-L-phenylalanine methyl ester from a mixture containing both α and β isomers thereof, which comprises admixing with said isomeric mixture hydrogen peroxide; an organic acid of the formula R—COOH, wherein R is hydrogen, C_1–C_3 alkyl, phenyl or substituted phenyl, wherein said substituent is one or more C_1–C_4 alkyl, chloro or cyano groups; and a min-

eral acid having a first dissociation constant of not less than 1.5×10^{-2} at 25° C.

4,549,988

3H-2-BENZAZEPINES

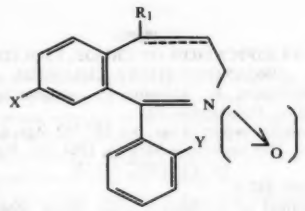
Rodney I. Fryer, North Caldwell; Eugene J. Trybulski, Parsippany, and Armin Walser, West Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 251,579, Apr. 6, 1981, abandoned, which is a continuation-in-part of Ser. No. 150,508, May 16, 1980, abandoned. This application Jun. 29, 1983, Ser. No. 509,256

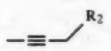
Int. Cl.⁴ C07D *223/16*

U.S. Cl. 260—239 BB **6 Claims**

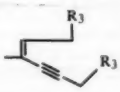
1. A compound of the formula



wherein X is hydrogen, chloro or bromo, Y is hydrogen, fluoro or chloro with the proviso that X and Y cannot both be hydrogen and R_1 is selected from the group consisting of a radical of the formula

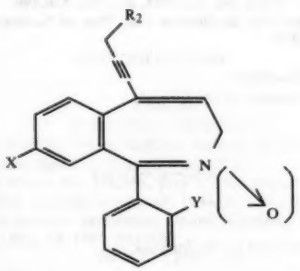


and a radical of the formula



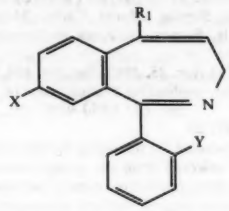
wherein R_2 is hydrogen, lower alkyl, hydroxy, amino, monoalkylamio and dialkylamino and R_3 is hydroxy, or amino with the proviso that where R_1 is other than hydrogen then the bonding at the 4,5-position is unsaturated and the pharmaceutically acceptable salt thereof.

2. A compound of the formula



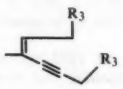
wherein X is hydrogen, chloro or bromo and Y is hydrogen, fluoro or chloro with the proviso that X and Y cannot both be hydrogen and R_2 is selected from the group consisting of hydrogen, lower alkyl, hydroxy, amino, monoalkylamino and dialkylamino and the pharmaceutically acceptable salts thereof.

4. The compound of the formula



wherein X is chloro, Y is hydrogen, fluoro or chloro and R_1 is a radical of the formula

or a radical of the formula



wherein R_2 is amino, monoalkylamino or dialkylamino and R_3 is amino.

4,549,989

PROCESS FOR THE PREPARATION OF MONOAMINOANTHRAQUINONES

Paul Schmutz, Münchenstein, and Hans-Jörg Angliker, Reinach, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

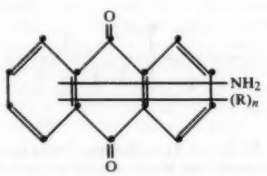
Filed Oct. 11, 1983, Ser. No. 540,734

Claims priority, application Switzerland, Oct. 19, 1982, 6083/82

Int. Cl.⁴ C07C *97/24, 97/26*

U.S. Cl. 260—378 **6 Claims**

1. A process for the preparation of a monoaminoanthraquinone of the formula



wherein R is a non-ionic substituent and n is 0, 1, 2 or 3, by reduction of a corresponding mononitroanthraquinone, which process comprises reacting said mononitroanthraquinone with formaldehyde, in the presence of a base and 2,3-dichloro-1,4-naphthoquinone as catalyst, in an aqueous alcoholic solution.

4,549,990

MANUFACTURE OF NON-SAPONIFIABLE COMPOUNDS FROM NATURAL SUBSTANCES AND THE RESULTING PRODUCTS

Marie-Christine Seguin, Monte Carlo, Monaco, and Jean Gueyne, Paris, France, assignors to Societe dite: Exsymol S.A.M.,

Filed Apr. 25, 1983, Ser. No. 488,277

Claims priority, application France, May 14, 1982, 82 08437

Int. Cl.[4] C07J *9/00*

U.S. Cl. 260—397.25 **20 Claims**

1. Improved process for obtaining liposoluble non-saponifiable compounds selected from the group consisting of sterols, terpenes and hydrocarbons from natural substances, by extraction by means of an organic solvent, characterized in that the solvent is an aliphatic or aryl ester, the molecule of which comprises at least 10 carbon atoms.

2. Process according to claim 1, characterized in that the solvent is a C_{14} to C_{38} ester.

4,549,991

PROCESS FOR CONTINUOUS HOT PHOSGENATION OF AMINES

Josef Disteldorf; Werner Hübel, both of Herne, and Johannes Reiffer, Essen, all of Fed. Rep. of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Oct. 11, 1983, Ser. No. 540,997

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1982, 3237541; Jul. 2, 1983, 3323882

Int. Cl.[4] C07C *69/00*

U.S. Cl. 260—453 PH **12 Claims**

1. A process for producing organic isocyanates in high yields and of high purity by a continuous hot phosgenation reaction comprising continuously feeding into a reactor phosgene and a solvent containing either (i) an amine hydrochloride or (ii) a carbamoyl chloride-hydrochloride mixture while continuously removing, from said reactor, solvent containing the organic isocyanate thereby produced, wherein the total quantity of solids consisting of either (i) or (ii) are essentially retained in the reactor by a separator.

4,549,992

ANTIHYPERTENSIVE AMIDES

John T. Suh, Greenwich, Conn.; Jerry W. Skiles, Tuckahoe, N.Y.; Bruce E. Williams, Cottage Grove, Minn., and Alfred Schwab, Williston Park, N.Y., assignors to USV Pharmaceutical Corp., Tarrytown, N.Y.

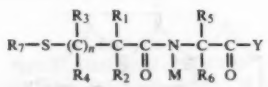
Continuation-in-part of Ser. No. 200,180, Oct. 24, 1980, Pat. No. 4,304,771, which is a continuation of Ser. No. 57,175, Jul. 13, 1979, Pat. No. 4,256,761. This application Mar. 8, 1982, Ser. No. 355,830

The portion of the term of this patent subsequent to Mar. 17, 1998, has been disclaimed.

Int. Cl.[4] C07C *153/017;* C07D *317/66*

U.S. Cl. 260—455 R **16 Claims**

1. Compounds of the structure



wherein

R_1, R_2, R_3, R_4 R_5 and R_6 are independently hydrogen, lower alkyl, lower alkenyl, lower alkynyl or phenyl-lower alkyl, wherein the lower alkyl, lower alkenyl and lower alkynyl groups have up to 6 carbon atoms,

n is an integer from 0 to 4,

M is cycloalkyl, cycloalkyl-lower alkyl, bicycloalkyl, fused arylcycloalkyl, lower alkylphenyl, hydroxyphenyl, methylenedioxyphenyl, bicycloalkyl-lower alkyl, halophenyl or alkylthiophenyl, and contains from 3 to 16 carbon atoms,

Y is hydroxy, lower alkoxy having 1 to 6 carbon atoms or amino,

R_7 is a group of the formula

wherein X is a branched alkane or a cycloalkyl or a cycloalkyl-loweralkyl, and where Y is hydroxy, their non-toxic pharmaceutically acceptable alkali metal, alkaline earth metal, and amine salts.

4,549,993

PURIFICATION OF CRUDE, LIQUID ORGANOSULFONYL CHLORIDE

Paul J. McElligott, Jr., Abington, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 597,302, Apr. 6, 1984, abandoned. This application May 14, 1984, Ser. No. 609,680

Int. Cl.[4] C07C *143/70*

U.S. Cl. 260—543 R **11 Claims**

1. A method of purifying a crude liquid organosulfonyl chloride product recovered from its manufacturing process or otherwise similarly contaminated which comprises first subjecting said crude product to scrubbing with a clean, aqueous hydrochloric acid solution having an acid concentration of at least about 18%, based on the weight of the solution, for a time sufficient to extract organosulfonic acid, separating the scrubbed product from the hydrochloric acid solution, and then stripping said scrubbed product at a temperature no greater than about 70° C. and under subatmospheric pressure of no greater than about 500 torr while an inert gas is caused to sweep the volatiles issuing from the organosulfonyl chloride being stripped, and thereafter recovering a purified organosulfonyl chloride product.

4,549,994

PREPARATION OF NEW FLUOROPIVALIC ACID FLUORIDES

Hermann Hagemann, Leverkusen; Erich Klauke, Odenthal, and Ernst Kysela, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

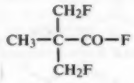
Filed Jul. 13, 1984, Ser. No. 630,490

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1983, 3326875

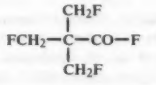
Int. Cl.[4] C07C *53/50*

U.S. Cl. 260—544 F **2 Claims**

1. A compound of the formula



2. A compound of the formula



4,549,995

PROCESS FOR MAKING ALKANEPHOSPHONOUS ACID ESTERS

Eberhard Auer; Klaus Gehrmann; Alexander Ohorodnik, all of Erftstadt, and Johannes Rosenthal, Cologne, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 23, 1983, Ser. No. 554,581

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1982, 3245365

Int. Cl.⁴ C07F *9/46*

U.S. Cl. 260—973 **4 Claims**

1. In the process for making alkanephosphonous acid esters of the following general formula I

(I)

in which x stands for an alkyl group having from 1 to 3 carbon atoms and y stands for an alkoxy group having from 4 to 6 carbon atoms, wherein an alkyldihalogenophosphane containing from 1 to 3 carbon atoms in the alkyl group is reacted with an aliphatic alcohol having from 4 to 6 carbon atoms at a temperature lower than the boiling point of the alkanephosphonous acid ester, and the components boiling at a lower temperature than the alkanephosphonous acid ester are distillatively separated from the reaction mixture, the improvement which comprises: introducing a stoichiometric excess each of the alkyldihalogenophosphane and aliphatic alcohol into a reaction column and reacting them therein at a temperature higher than the boiling point of the reactants but lower than the boiling point of the resulting alkanephosphonous acid ester, this latter being obtained in the base portion of the reaction column and being removed therefrom; continuously expelling overhead of the reaction column a vaporous mixture consisting of by-products formed during the reaction, in the form of hydrogen halide and halide of the aliphatic alcohol, together with aliphatic alcohol in excess, and separating the mixture into its components in a series-connected distilling column, the aliphatic alcohol obtained in the base portion of the distilling column being removed therefrom and recycled into the reaction column, and selectively condensing the mixture issuing overhead with recovery of hydrogen halide gas and liquefied halide of the aliphatic alcohol.

4,549,996

PERFUME DISPENSER

Geoffrey Farrell, Crewe, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 376,168, May 7, 1982, Pat. No. 4,499,012. This application Nov. 19, 1984, Ser. No. 653,502

Claims priority, application United Kingdom, May 8, 1981, 8114055; Sep. 28, 1981, 8129168

Int. Cl.⁴ C11B *9/00*

U.S. Cl. 261—19 **4 Claims**

1. A perfume dispenser comprising an inert container containing a perfume dispensing material wherein the material comprises granules having a granule size of over 1000 microns, of vermiculite impregnated, with one or more perfume oils, at least 10% of the weight of the material being perfume oil.

4,549,997

DEVICE FOR INCREASING THE OXYGEN CONCENTRATION IN A SUBSURFACE STRATUM OF A THERMALLY STRATIFIED BODY OF WATER

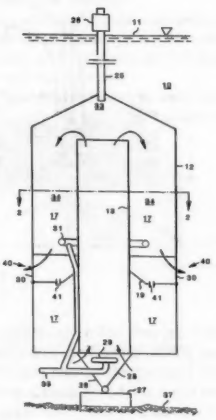
Bo L. Verner, Antwerp, and Lars B. S. Fors, Wilrijk, both of Belgium, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed May 22, 1984, Ser. No. 612,791

Claims priority, application Sweden, May 30, 1983, 8303030

Int. Cl.⁴ B01F *3/04*

U.S. Cl. 261—77 **1 Claim**



1. Apparatus for increasing the oxygen concentration in a subsurface stratum of a thermally stratified body of water while maintaining undisturbed the thermal stratification thereof, comprising:

(a) an inner open-ended vertical tube (**13**) having upper and lower ends and an outer surrounding shell (**12**), both located in said subsurface stratum and both composed of collapsible, flexible material and defining therebetween downwardly-extending channel means (**34**);

(b) said outer shell (**12**) having a closed upper end forming a gas collecting chamber (**33**) above said vertical tube (**13**);

(c) sheet means (**17**) between said tube (**13**) and said shell (**12**) to maintain the spacing between said tube (**13**) and said shell (**12**),

(d) first nozzle means (**29**) for introducing an oxygen-containing gas under pressure into said lower open end of said tube (**13**) effective to cause an upward flow of water therein under simultaneous oxygenation thereof;

(e) controlled venting means (**25,26**) for venting undissolved oxygen gas from said gas collecting chamber (**33**) to the atmosphere to maintain a predetermined pressure in said gas collecting chamber sufficient to impart a downward flow of the oxygenated water in said channel means (**34**);

(f) second nozzle means (**31**) for introducing gas under pressure into said channel means to retard said downward flow;

(g) outlet means (**40**) in said channel means (**34**) for passing said retarded downward flow of oxygenated water into the ambient non-oxygenated substratum body of water;

(h) control means (**30**) for adjusting said outlet means (**40**) to maintain a pressure in said channel means (**34**) sufficient to maintain said tube (**13**) and said shell (**12**) in non-collapsed condition.

4,549,998

CONTACTING DEVICE

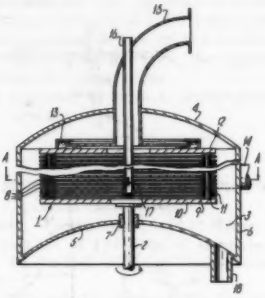
John E. Porter, Newcastle upon Tyne, and Colin Ramshaw, Norley, both of England, assignors to Imperial Chemical Industries PLC, Hertfordshire, England

Continuation of Ser. No. 444,336, Nov. 24, 1982, abandoned. This application Feb. 13, 1985, Ser. No. 701,446

Claims priority, application United Kingdom, Nov. 24, 1981, 8135407

Int. Cl.⁴ B01F *3/04*

U.S. Cl. 261—88 **6 Claims**



1. In a centrifugal device for contacting a first liquid with a gas or a second liquid comprising: a rotor having a plurality of plates mounted transversely to and coaxially with the axis of rotation of said rotor and being spaced apart along said axis, at least one surface of each of said plates being capable of creating perturbations in any liquid flowing across it; means to charge said first liquid to a radially inner part of said rotor; means to charge said gas or second liquid to said rotor; and means to collect liquid discharged from said rotor, the improvement wherein the said plates are spaced apart by a distance of 0.2 to 5 mm along said axis and wherein at least a portion of said perturbations are caused by a plurality of continuous substantially V-shaped channels in said surfaces, the radially outer surface of each of said channels being steeper than the radially inner surface thereof.

4,549,999

COOLING TOWER

Gunter Ernst, 57 Strasse des Roten Kreuzes, Karlsruhe, Fed. Rep. of Germany; Edmund Baer, Karlsruhe, Fed. Rep. of Germany; Dieter Wurz, Pfinztal, Fed. Rep. of Germany, and Hans Dittrich, Karlsruhe, Fed. Rep. of Germany, assignors to Gunter Ernst, Fed. Rep. of Germany

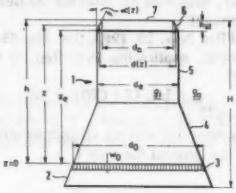
Continuation-in-part of Ser. No. 28,659, Apr. 10, 1979, abandoned, and a continuation-in-part of Ser. No. 147,264, May 5, 1980, , which is a continuation-in-part of Ser. No. 932,431, Aug. 10, 1978, abandoned, which is a continuation of Ser. No. 756,982, Jan. 5, 1977, abandoned, which is a continuation of Ser. No. 557,350, Mar. 11, 1975, abandoned, said Ser. No. 147,264, is a continuation-in-part of Ser. No. 971,895, Dec. 21, 1978, abandoned, which is a continuation of Ser. No. 832,688, Sep. 12, 1977, abandoned, which is a division of Ser. No. 756,982, Jan. 5, 1977, abandoned. This application Jan. 29, 1981, Ser. No. 229,513

Int. Cl.⁴ B01F *3/04*

U.S. Cl. 261—109 **9 Claims**

1. In a natural draught cooling tower having a shell with a crown region inwardly tapered with respect to the vertical to provide an inlet/outlet diameter ratio sufficient to produce a pressure gradient inside said crown immediately adjacent the wall thereof equal to or greater than the pressure gradient outside said crown immediately adjacent the wall thereof and a crown height to total tower height ratio between about 1/33 and about 1/10, the improvement:

wherein the height of the crown region is not greater than twenty percent of the outlet diameter of the cooling tower;



wherein the angle α of the inclination of the internal contour of the shell in the crown region to the vertical is at least as great as:

$$\alpha \geqq \arctan\left(\frac{g}{4}\right)\left(\frac{\delta a - \delta i}{\delta a}\right)\left(\frac{d0}{w0^2}\right)\left(\frac{d(z)}{d0}\right)^5$$

g = acceleration due to gravity;
δa = gas density outside the cooling tower;
δi = gas density inside the cooling tower;
z = the vertical coordinate;
$d0$ = internal diameter at z equal zero;
$d(z)$ = internal shell diameter at the height z; and
$w0$ = gas velocity at z equal zero; and

wherein the crown region is free of any additional wind deflector means.

4,550,000

APPARATUS FOR CONTACTING A LIQUID WITH A GAS

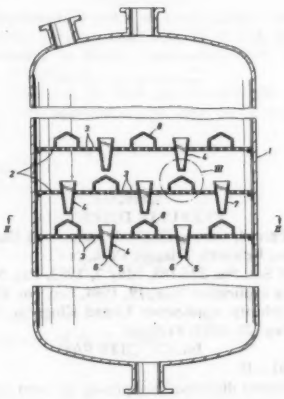
Jeremy B. Bentham, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 485,345, Apr. 15, 1983, abandoned. This application Aug. 15, 1984, Ser. No. 640,549

Claims priority, application United Kingdom, Apr. 15, 1982, 8210980

Int. Cl.⁴ B01F *3/04*

U.S. Cl. 261—114 R **3 Claims**



1. An apparatus for contacting a liquid with a gas comprising a normally vertically extending column having at least one inlet and outlet, said column having a plurality of internal

substantially horizontal trays spaced from each other and arranged in the column one above the other, each of the trays being provided with apertures for the passage of gas and with at least one means for downward transfer of liquid, said means for downward transfer of liquid providing liquid flow from the upper side of a tray to a point below the tray, the means for downward transfer of liquid comprising means for discharge of liquid; and means for distributing the flow of liquid from at least the majority of said means for discharge of liquid over the respective trays beneath said means for discharge, said means for distributing the flow of liquid being separate from the means for downward flow of liquid and positioned beneath the respective means for discharge, but spaced above the tray beneath said means for discharge, each said means for distributing the flow of liquid comprising a perforated structure having a plurality of apertures positioned over the greater portion thereof, the perforated structure being substantially co-extensive with the means for discharge of liquid.

4,550,001
PROCESS FOR PRODUCING SHAPED ARTICLES HAVING IMPROVED SURFACES

Taro Suminoe, Tokyo; Tetsuo Ito, Machida; Yasuhiro Kiyomatsu, Yokohama, and Takao Shimizu, Toda, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd. and Ricky Contact Lens Research Institute Inc., both of Tokyo, Japan

Continuation of Ser. No. 388,993, Jun. 16, 1982, abandoned. This application Mar. 9, 1984, Ser. No. 586,656

Claims priority, application Japan, Jun. 22, 1981, 56-96162; Oct. 9, 1981, 56-160249; Dec. 29, 1981, 56-213132

Int. Cl.⁴ C08J *7/14*

U.S. Cl. 264—2.6 **14 Claims**

1. A process for producing a shaped article having an improved surface, comprising subjecting a shaped article consisting of a substantially nonhydrous polymer derived from a monomer mixture comprising at least 80 mole % of at least one monomer selected from acrylates and methacrylates, 0.5 to 10 mole % of a polyfunctional monomer, and 0 to 5% by volume of acrylic acid or methacrylic acid to at least one treatment selected from a treatment with an aqueous solution of an inorganic salt, an organic salt or a combinatin of them at a temperature of 90° C. to boiling point at atmospheric pressure or at a temperature of 100° C. to boiling point under pressure, a treatment with an aqueous alkali solution of 5 to 50% by weight at a temperature of 30° C. to 120° C. and a treatment with an aqueous acid solution of 5 to 90% by weight at a temperature of 60° to 100° C., the said treatment with an aqueous alkali solution or an aqueous acid solution improving the 0.01–50-μm thick surface portion of the shaped article.

4,550,002
METHOD AND APPARATUS FOR ACHIEVING OPTIMUM DISCHARGE FROM A TWIN-SCREW EXTRUSION DEVICE

Eberhard Uhland; Manfred Dienst, both of Burgdorf, and Claus-Heinrich Wente, Hanover, all of Fed. Rep. of Germany, assignors to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Mar. 16, 1984, Ser. No. 590,574

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1983, 3310484

Int. Cl.⁴ B29F *3/08*

U.S. Cl. 264—40.1 **10 Claims**

1. A method of operating a dose-charged extrusion device having twin screws to achieve optimum quantitative discharge of a material being extruded, comprising the steps of:

(a) feeding material to said extrusion device in variably controlled quantity dosages;

(b) monitoring the torque of the screws and comparing the monitored torque value with a pre-selected maximum torque value, such pre-selected value being less than the maximum operational torque value by a safety margin;

(c) monitoring the temperature of the material being extruded and comparing the monitored temperature value with a pre-selected maximum value, such pre-selected temperature value being less than the decomposition or otherwise determined maximum operational processing temperature of said material by a safety margin;

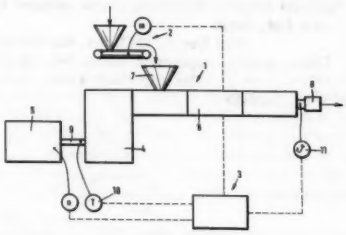
(d) modifying the dosage quantity of material and the speed of the screws when said monitored torque and temperature values differ from said pre-selected maximum torque and temperature values therefor until the desired maximum value of torque and temperature are reached, at which time optimum operating conditions regarding the quantity and temperature of the material are achieved, and

(e) discharging the extruded material.

8. An apparatus for operating a dose-charged twin-screw extrusion device to achieve optimum quantitative discharge of a material being extruded, said extrusion device comprising

(a) drive means for said twin screws,

(b) means for dose-charging material to said extrusion device, and means for driving said dose-charging means,



(c) regulator means operatively connected to said drive means for said twin screws and said drive means for said dose-charging means,

(d) torque monitoring means operatively connected to said regulator means for monitoring the torque produced by said twin screws and producing a signal indicative of said torque, and

(e) temperature monitoring means operatively connected to said regulator means for monitoring the temperature of said material being extruded and producing a signal indicative of the temperature of said material,

said regulator means controlling both of said drive means for controlling the speed of rotation of said twin screws and the feed of material to said extrusion device by said dose-feeding means in response to said signals whereby optimum conditions of temperature and quantity of extruded material can be achieved.

4,550,003
VINYLIDENE CHLORIDE TYPE RESIN EXPANDABLE PARTICLES, FOAM PARTICLES, IN-MOLD FOAM MOLDING BY USE THEREOF AND PROCESS FOR PRODUCING THEM

Norihiko Sakata, and Nobuo Miura, both of Suzuka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 5, 1984, Ser. No. 678,416

Claims priority, application Japan, Dec. 13, 1983, 58-233602; Dec. 14, 1983, 58-235594

Int. Cl.⁴ B29H *7/20;* **C08J** *9/18*

U.S. Cl. 264—53 **15 Claims**

1. A process for producing expandable vinylidene chloride resin particles, which comprises bringing substantially non-crystalline vinylidene chloride resin particles with an average particle size within the range of from 0.05 to 5 mm, which are smooth on the surfaces without interstices into contact with a volatile organic blowing agent, which is a single substance or a mixture of two or more compounds having boiling points not

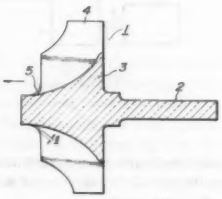
higher than 60° C. and its molar average solubility parameter (SP value) is within the range of from 5.7 to 7.0, at a temperature of 50° to 120° C. thereby impregnating the particles with said blowing agent.

4,550,004

METHOD OF PRODUCING RADIAL TYPE CERAMIC TURBINE ROTOR

Takeyuki Mizuno, Toyohashi, Japan, assignor to NGK Insulators, Ltd., Japan

Filed Dec. 5, 1983, Ser. No. 557,923
Claims priority, application Japan, Dec. 15, 1982, 57-219671
Int. Cl.⁴ C04B *35/64*
U.S. Cl. 264—63 **7 Claims**



1. A method of producing a radial type ceramic turbine rotor having a shaft, a hub having an air entrance side and an air exit side and being connected to said shaft, a blade portion radially extending from said hub, said air exit side of said hub axially extending further than said blade portion, said method comprisng the steps of predetermining an appropriate size and shape for a fillet portion which is located on said air exit side of the hub at a connection between said hub and blade portions, injection molding a ceramic rotor body such that it has a thicker fillet portion than said predetermined fillet portion, said thicker fillet portion being at least 0.5 mm thicker than said predetermined fillet portion, heating said injection molded rotor body for removing a plasticizer therefrom, machining said thicker fillet portion of said molded rotor body until said thicker fillet portion becomes the same size and shape of said predetermined fillet portion and sintering said molded rotor body.

4,550,005

EXTRUSION DIE FOR CERAMIC HONEYCOMB STRUCTURE

Kiminari Kato, Nagoya, Japan, assignor to NGK Insulators, Ltd., Japan

Filed Feb. 24, 1984, Ser. No. 583,203
Claims priority, application Japan, Sep. 24, 1983, 58-175174
Int. Cl.⁴ B29F *3/04*
U.S. Cl. 264—177 R **10 Claims**

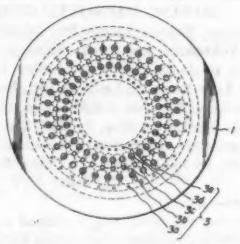
1. A method of extruding a honeycomb structural body having a plurality of different wall thicknesses, said wall thicknesses ranging in size from comparatively thick to comparatively thin, and at least two through holes, wherein an extrusion die assembly for use in the extruding method comprises a plurality of discharge slots corresponding to a cross-sectional shape of the honeycomb structure which is to be produced; batch feed passageways in communication with said plurality of discharge slots, the batch feed passageways having hydraulic diameters of at least two different sizes, wherein the batch feed passageways which communicate with discharge slots which produce said comparatively thin wall thicknesses have hydraulic diameters which are larger than hydraulic diameters of the batch feed passageways which communicate with discharge slots which produce said comparatively thick wall thicknesses, the method comprising;

pressurized feeding of a green material into said batch feed passageways;

feeding said green material into said plurality of discharge slots from said batch feed passageways;

flowing said green material which is fed into said discharge slots, in directions substantially perpendicular to an extrusion flow direction of said green material when it is fed into said batch feed passageways, said perpendicular flow occurring simultaneously with said extrusion direction flow; and

integrating the thus extruded green material to form a honeycomb structural body.



2. An extrusion die assembly for producing a ceramic honeycomb structure having a plurality of different wall thicknesses, said wall thicknesses ranging in size from comparatively thick to comparatively thin, and at least two through holes, said extrusion die assembly comprising:

a plurality of discharge slots corresponding to a cross-sectional shape of the ceramic honeycomb structure which is to be produced;

batch feed passageways in communication with said plurality of discharge slots, the batch feed passageways having hydraulic diameters of at least two different sizes, wherein the batch feed passageways which communicate with discharge slots which produce said comparatively thin wall thicknesses in the ceramic honeycomb structure have hydraulic diameters which are larger than hydraulic diameters of the batch feed passageways which communicate with discharge slots which produce said comparatively thick wall thicknesses in said ceramic honeycomb structure.

4,550,006

METHOD OF MAKING A MOLDED PART UTILIZING A LIQUID INJECTION MOLDING APPARATUS

Aldo A. Laghi, Saratoga, N.Y., assignor to General Electric Company, Waterford, N.Y.

Division of Ser. No. 272,424, Jun. 10, 1981, Pat. No. 4,402,657.
This application Jun. 2, 1983, Ser. No. 500,475
Int. Cl.⁴ B29F *1/00*
U.S. Cl. 264—328.2 **2 Claims**

1. In a method of making a molded part from a liquid injection molding composition utilizing a liquid injection molding apparatus, comprising:

(a) feeding molding composition into a conduit slidably mounted on the forward end of a frame and on the forward end of a mold frame means;

(b) causing a first plate means having passage means therein for the passage of molding composition and a nozzle

means located at the end of said passage means in said first plate means to come into contact with a mold cavity means;

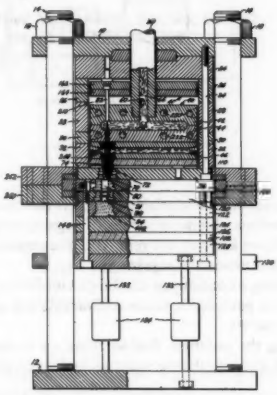
(c) retracting a closing pin means slidably mounted in said mold frame means so as to open a nozzle opening means in said nozzle means;

(d) allowing molding composition to pass into said mold cavity means;

(e) causing said closing pin means to close said nozzle means after the required amount of molding composition has passed into said mold cavity means;

(f) causing said first plate means to retract from said mold cavity means;

(g) curing said molding composition in said mold cavity means;



(h) the improvement which comprises utilizing a shuttle plate means adjacent to said nozzle means to automatically take a finished molded part from said mold cavity means and pass it out of the mold apparatus by knocking out said molded part with a knock-out plate means located on both sides of said nozzle means, in the same plane as said nozzle means, and substantially external to support post means, and wherein said knock-out plate means comprises first and second knock-out plates containing knock-out pins which fit in the mold cavities of said shuttle plate means while said shuttle plate means is moving so as to knock-out the molded parts in the mold cavities in said moving shuttle plate means.

4,550,007

PROCESS FOR PRODUCTION OF A PLASTIC BOTTLE

Yoichi Ohtsu; Kohei Kanno, both of Hiratsuka, and Hiroshi Nagano, Tokyo, all of Japan, assignors to Mitsubishi Plastics Industries Limited, Tokyo, Japan

Division of Ser. No. 437,485, Oct. 28, 1982, abandoned. This application Mar. 22, 1984, Ser. No. 592,273

Claims priority, application Japan, Nov. 10, 1981, 56-180244

Int. Cl.[4] B29C *17/07*

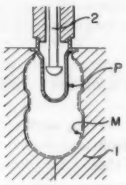
U.S. Cl. 264—521 **11 Claims**

1. A process for producing a plastic bottle wherein all portions except for the neck have substantially uniform thickness, a density of at least 1.379, and the internal volume increase rate is less than 3.4% when the bottle filled with a liquid at 20° C. containing a two gas volume of CO_2 is immersed in 75° C. water for 30 minutes, which comprises blow stretching a parison of polyethylene terephthalate in a first mold to form an intermediate product, transferring the intermediate product to a second mold while the intermediate product which has undergone shrinkage is still soft, and restretching the intermediate product in the second mold and which process is characterized by the following steps:

(A) heating the parison to a temperature 20°–30° C. higher than the glass transition temperature;

(B) simultaneously or subsequently to step (A) adjusting the portions of the parison corresponding to the shoulder and bottom portions of the bottle to a stretching temperature higher by from 2° to 5° C. than the temperature of the portion corresponding to the body portion of the bottle at the time of heating the parison in step (A);

(C) forming the intermediate product by blow stretching the



temperature adjusted parison from 10 to 14 times as a product of the stretching rates in axial and radial directions in the first mold heated to a temperature of at least 150° C. and at least 20° C. below the melting point of the parison and subjecting the intermediate product to heat treatment by maintaining it in intimate contact with the inner wall of the first mold for a predetermined period of time;

(D) transferring the intermediate product to a second mold having an internal volume of from 75 to 95% relative to the internal volume of the first mold, and

(E) restretching it in the second mold to obtain the bottle.

4,550,008

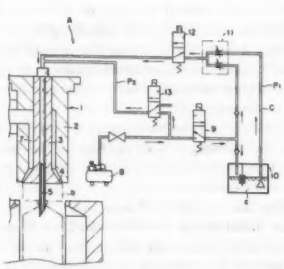
METHOD FOR MOLDING PLASTIC PRODUCTS

Shoji Shimizu, Ohta, Japan, assignor to Excell Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 273,396, Jun. 15, 1981, abandoned. This application May 18, 1983, Ser. No. 494,693

Int. Cl.[4] B29C *17/12, 17/07*

U.S. Cl. 264—527 **5 Claims**



1. A method for producing a plurality of sheet-type plastic products at the same time out of a single parison by means of blow molding comprising the steps of:

extruding a parison out of a nozzle while supplying a pressurized gas at a first pressure level and a separating agent into the interior of said parison thereby forming a thin film of separating agent along the inside surface of said parison;

assembling a plurality of mold sections around said parison to place said parison in the mold cavity defined by the assembled mold sections, each of said mold sections having a predetermined molding surface and being so struct-

tured that a flash-forming recess is defined along the joint line between two adjacent mold sections when assembled, said products being defined by the molding surfaces on either side of said flash forming recess;

supplying a pressurized gas at a second pressure level into said parison thereby pneumatically pressing said parison against the molding surface of each of said assembled mold sections to carry out shaping whereby part of said parison is pushed into said recess to form a flash having a film of separating agent sandwiched therein and extending from the inside surface of said parison into said flash beyond an edge on each of said products, said edge being defined during subsequent flash removal;

cooling said parison thus shaped to a predetermined temperature;

disassembling said plurality of mold sections when said shaped parison is hardened to possess the ability to maintain its shape; and

removing said flash having sandwiched therein said film of separating agent from said shaped parison thereby producing a plurality of sheet-type products out of said parison.

4,550,009

METHOD OF MAKING BLOW-MOLDED PARTS OF THERMOPLASTIC MATERIAL

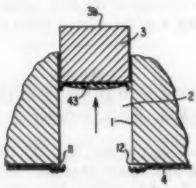
Heinz Burkel, Oberkotzau, Fed. Rep. of Germany, assignor to REHAU Plastiks AG & Co., Rehau, Fed. Rep. of Germany

Filed Feb. 22, 1984, Ser. No. 582,442

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1983, 3306469

Int. Cl.⁴ B29C *17/07, 17/08*

U.S. Cl. 264—529 **4 Claims**



1. A method of making blow-molded bodies from thermoplastic material, comprising the following steps:

(a) inflating a hollow parison within a mold cavity for causing the parison to expand and conform to inner wall surfaces defining the mold cavity, whereby the blow-molded body is shaped;

(b) further inflating the blow-molded body within said mold cavity for causing a wall portion of the body to expand beyond the mold cavity from an original position into a port cavity communicating with the mold cavity thereby reducing the thickness of said wall portion;

(c) while maintaining the blow-molded body in a plastic state, applying a counter pressure on an outer face of said wall portion for moving said wall portion back in the direction of the mold cavity substantially into said original position against an inflating pressure prevailing within the blow-molded body, whereby connecting portions attaching said wall portion to said blow-molded body are reduced in thickness; and

(d) discontinuing the application of the counter pressure for allowing said wall portion to be driven anew away from the mold cavity into said port cavity by the inflating pressure; said wall portion separating entirety from said blow-molded body not later than upon finally discontinuing the application of the counter pressure, whereby an aperture in the blow-molded body is formed.

4,550,010

PROCESS FOR DEODORIZING POLLUTED AIR

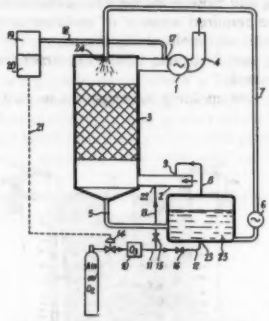
Gérard Chelu, Verneuil en Halatte, France, assignor to Charbonnages de France, Paris, France

Filed Jan. 15, 1982, Ser. No. 339,737

Claims priority, application France, Jan. 19, 1981, 81 00906

Int. Cl.⁴ A61L *9/015, 9/14*

U.S. Cl. 422—4 **9 Claims**



1. A process for deodorizing polluted air containing foul-smelling, noxious gaseous residues of organic origin comprising aldehydes or ketones and removing the objectionable smell therefrom said process comprising:

(1) providing a continuous, closed-circuit flow of an aqueous hydrogen peroxide solution and circulating same within a closed circuit;

(2) passing the polluted, foul-smelling air to be deodorized through the circulating aqueous hydrogen peroxide solution;

(3) bubbling ozone into the circulating aqueous hydrogen peroxide solution and thereby supplementing and maintaining the hydrogen peroxide content of said solution within predetermined values in an amount effective to deodorize the air being treated; and

(4) continuing to circulate and recirculate the ozone-supplemental aqueous hydrogen peroxide solution while contacting the air to be treated with the solution.

4,550,011

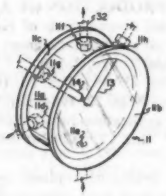
SAMPLE FLOW CELL FOR AUTOMATIC HALOGEN AND PH CONTROL FOR WATER RESERVOIRS

Roy L. McCollum, 14210 Broadgreen, Houston, Tex. 77079

Filed Jul. 1, 1983, Ser. No. 510,415

Int. Cl.⁴ G01N *27/38*

U.S. Cl. 422—68 **1 Claim**



1. A sample flow cell for monitoring the halogen and pH level in a flowing liquid stream including:

a. a hollow closed housing formed of clear material;

b. said housing having a first inlet opening for the flowing liquid stream on one side of said housing;

c. said housing having an outlet opening for the flowing liquid stream at the top of said housing;

d. said housing having a second inlet opening for acid at the bottom of said housing;

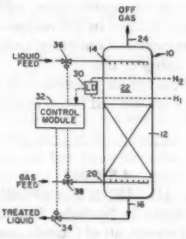
e. said housing having a pair of additional openings through which halogenic and pH sensing probes are positioned to terminate within said housing between the outlet and second inlet openings said first and second inlet openings and said probes being arranged in said housing such that the acid conducted into the bottom of the housing is mixed with the flowing liquid stream and contacts and cleans the probes before discharging out the top of the housing.

4,550,012

MULTI-PHASE COUNTERCURRENT REACTOR SYSTEM

Joe E. Penick, Princeton, N.J., assignor to Mobil Oil Corp., New York, N.Y.

Filed May 1, 1984, Ser. No. 605,740
Int. Cl.[4] B01J *8/10*; B01D *19/02*
U.S. Cl. 422—106 **8 Claims**



1. A countercurrent continuous catalytic reactor system for treating a liquid phase with a gaseous reactant comprising:

an enclosed reactor shell containing a fixed porous bed of solid catalyst;

upper liquid inlet means for introducing a stream of liquid substantially above the catalyst bed for downward gravity flow through the bed;

lower liquid outlet means for withdrawing treated liquid from the reactor shell;

gas inlet means disposed below the catalyst bed for introducing a gaseous reactant stream under pressure for countercurrently contacting downwardly flowing liquid in a mixed phase reaction zone, whereby gaseous reactant is dispersed through the liquid phase in intimate contact with the solid catalyst;

upper gas outlet means for withdrawing gas from the reactor shell above the catalyst bed;

level detector means disposed in a froth zone above the catalyst bed for detecting level of a mixed gas-liquid froth and generating a signal representative of froth level; and

fluid handling control means operatively connected to the level detector means and responsive to said level signal to control fluid stream flow for regulating froth level above the catalyst bed, thereby permitting disengagement of dispersed gas from the liquid phase of the froth and preventing excessive liquid entrainment in the gas outlet.

4,550,013

DECREASING CARBON BLACK REACTOR FOULING RATE

Paul J. Cheng, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 281,754, Jul. 9, 1981, Pat. No. 4,371,511. This application Sep. 3, 1982, Ser. No. 414,288
Int. Cl.[4] C09C *1/48*
U.S. Cl. 422—151 **4 Claims**

1. An apparatus for feeding oil into a carbon black reactor for the purpose of decreasing the fouling rate within the carbon black reactor, said apparatus comprising

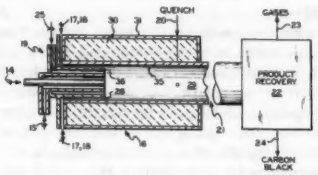
(a) a first feed oil tube;

(b) a means for supplying a contaminant-rich oil into the first feed oil tube;

(c) a second feed oil tube surrounding and having the same axis as said first feed oil tube;

(d) a means for supplying a contaminant-poor oil into the second feed oil tube;

(e) a circular first multiply perforated plate having an overall



diameter substantially equal in value to the external diameter of said second feed oil tube and having a centrally located perforation with a diameter substantially equal in value to the external diameter of said first feed oil tube fitted around said first feed oil tube and fitted to said second feed oil tube;

(f) a plurality of spray nozzles fitted to the noncentrally located perforations of said multiply perforated plate; and

(g) a tube or tubes for cooling mediums, said tube or tubes being coaxial with and surrounding said second feed oil tube.

4,550,014

METHOD FOR PRODUCTION OF FREE-STANDING POLYCRYSTALLINE BORON PHOSPHIDE FILM

Richard J. Baughman, and David S. Ginley, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 9, 1982, Ser. No. 416,409
Int. Cl.[4] C01B *35/04*
U.S. Cl. 423—289 **8 Claims**

1. A process for producing a free-standing boron phosphide film comprising the sequential steps of: (1) heating a metal substrate, selected from the group consisting of titanium, molybdenum, tantalum or tungsten, in a vertical growth apparatus to a temperature of about 650°–1050° C.; (2) flowing reactant gases over said metal substrate thereby growing a boron phosphide film thereon by chemical vapor deposition, the flow time being sufficient to grow a boron phosphide film of a predetermined thickness on said substrate; and (3) cooling said substrate and grown boron phosphide film to cause separation of said boron phosphide film from said substrate as a result of the difference in rate of contraction of said metal substrate with respect to said boron phosphide film thereby producing a free-standing crystalline boron phosphide film, said difference in rates of contraction on cooling being sufficient to cause separation of the substrate from the film.

4,550,015

VITREOUS CARBON AND PROCESS FOR PREPARATION THEREOF

Louis L. Korb, and Phillip A. Waitkus, both of Sheboygan, Wis., assignors to Plastics Engineering Company, Sheboygan, Wis.

Continuation-in-part of Ser. No. 477,235, Mar. 21, 1983, abandoned, which is a continuation-in-part of Ser. No. 397,497, Jul. 12, 1982, abandoned, which is a continuation of Ser. No. 220,361, Dec. 19, 1980, abandoned, which is a continuation-in-part of Ser. No. 50,531, Jun. 21, 1979, abandoned. This application Apr. 12, 1984, Ser. No. 599,737

Int. Cl.[4] C01B *31/00*

U.S. Cl. 423—445 25 Claims

1. A process for preparing a vitreous carbon from a solid thermosettable intimate blend comprising 30–76 percent by weight of a finely divided carbonaceous particulate filler and 24–70 percent by weight of a finely divided phenolic resin mixture comprising 20–80 parts by weight of a phenolic-furfuraldehyde Novolak resin, which is fusible upon heating, and 20–80 parts by weight of a phenolic-aldehyde resol resin, which is thermosettable upon heating, the sum of said parts of Novolak and resol resins totaling 100 parts by weight, the aldehyde in said Novolak comprising at least 50 molar percent of furfuraldehyde, comprising the steps of:

(1) grinding said phenolic furfuraldehyde Novolak resin to a particle size of less than 40 mesh on a U.S. Standard sieve;

(2) grinding said phenolic-aldehyde resol resin to a particle size of less than 40 mesh on a U.S. Standard sieve;

(3) mixing said ground resins together with said finely divided carbonaceous powder to a homogeneous mixture;

(4) molding the resultant mixture at a temperature of 100°–180° C. and a pressure between 500 pounds per square inch and 8 tons per square inch; and

(5) heating the resultant molded product gradually up to a temperature of 600°–700° C. with the temperature increased at a rate of 1°–5° C. per hour, then above the range of 600°–700° C. at an increasing rate of 10°–50° C. per hour up to 800°–850° C. and thereafter at 20°–25° C. per hour up to a maximum temperature of 1800°–3000° C., which maximum temperature is held for at least 24 hours.

4,550,016

COMPOSITE CYTOLOGIC COUNTERSTAIN FORMULATION

Cynthia J. Harris, Burke, Va.

Filed Sep. 30, 1982, Ser. No. 429,662

Int. Cl.[4] G01N *31/00, 33/48*

U.S. Cl. 424—3 3 Claims

1. A method of rapid cytological diagnosis of human cells comprising the steps of

(a) fixing a specimen on a slide,

(b) staining the specimen in a solution of hematoxylin,

(c) hydrating the specimen, and thereafter,

(d) staining the specimen in a composite cytologic counterstain for obtaining within a few minutes a specimen which when examined by a microscope provides a visual image exhibiting contrast and coloration comparable to that obtained by Papanicolaou method of staining, which consists essentially of

6 ml of an aqueous solution of about 8–18% total dye content of orange G, 20 ml of an aqueous solution of about 2–8% total dye content of light green SF yellowish, 20 ml of an aqueous solution of about 10–25% total dye content of eosin Y, from 20–30 ml of glacial acetic acid, from 2–8 grams of phosphotungstic acid, and the balance, to make one liter, of a mixture of methyl and ethyl alcohols.

4,550,017

FLUORESCENCE SCREENING FOR BLOOD TYPING

Yen-Ping Liu, Santa Clara; Edwin F. Ullman, Atherton, and Martin J. Becker, Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Pala Alto, Calif.

Filed Oct. 15, 1982, Ser. No. 434,761

Int. Cl.[4] G01N *33/54, 33/80*

U.S. Cl. 424—11 8 Claims

1. A method for determining in a sample the presence of a surface antigen of red blood cells bound to said cells or antibodies to such surface antigen, which comprises:

combining a sample suspected of containing either a surface antigen of red blood cells bound to said cells or antibodies to said surface antigen with fluorescent particles conjugated with either (1) receptor homolgous to said surface antigen ("receptor conjugate") or (2) said surface antigen ("antigen conjugate");

wherein for the determination of the surface antigen bound to said red blood cells only receptor conjugate is employed, and

for the determination of said antibodies: (a) antigen conjugate is employed in combination with red blood cells having the same antigen or (b) receptor conjugate is employed in the presence of red blood cells having an homologous surface antigen; and

determining the change in fluorescence as compared to a sample having a known red blood cell antigen or antibody thereto.

4,550,018

DENTAL HYGIENE COMPOSITIONS

Suhas H. Ambike, Westhill; Narinder S. Grewal, Scarborough, and Eric Blaser, Toronto, all of Canada, assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 350,671, Feb. 22, 1984, abandoned. This application Sep. 26, 1984, Ser. No. 655,275

Int. Cl.[4] A61K *7/16, 7/18*

U.S. Cl. 424—52 6 Claims

1. A liquid mouthwash composition having antimicrobial activity against plaque forming microorganisms and comprising from 0.1 to 2.0 percent by weight of one or more highly pure alkali metal salts of dodecyl sulphate having less than 5% non-dodecyl alkyl sulphate salts, 0.5 to 2.0% by weight of alkali metal N-acyl sarcosinate, and a physiologically-acceptable acidic buffer at pH in the range of 3.0 to 5.0, dissolved in one or more vehicles physiologically compatible with the teeth and mouth tissues, and 10 to 30% by weight ethyl alcohol.

4,550,019

MANUFACTURE AND USE OF FOWL EGG ANTIBODIES

Alfred Polson, Camps Bay, South Africa, assignor to South Africa Inventions Development Corporation, Pretoria, South Africa

Continuation-in-part of Ser. No. 20,786, Mar. 15, 1979, Pat. No. 4,357,272. This application Jul. 16, 1982, Ser. No. 399,094

Int. Cl.[4] A61K *39/42, 39/40, 39/12, 39/00*

U.S. Cl. 424—85 59 Claims

1. A process for producing and isolating IgY antibodies, which comprises the steps of:

(1) actively immunizing a fowl hen by injecting said hen with an immunogen carrying immunogenic determinants specific to elicit such antibodies, wherein an immunogen having a molecular or particle weight greater than 30,000 daltons, that when injected into a fowl hen induces an immune response;

(2) continuing to immunize against the determinants by repeatedly injecting said hen with said immunogen over a period of not less than three weeks and at least to that stage of hyperimmunisation which is indicated by a plateau-like levelling-off and persistance of the concentration of antibodies against the determinants in the serum of the fowl;

(3) after said period, collecting eggs of the immunised hen which now contain said antibodies in the yolk; and

(4) separating the yolk, separating from the yolk lipid and non-antibody proteinaceous matter and recovering IgY antibodies from the yolk in purified and essentially intact, undamaged form.

4,550,020

POLYPEPTIDE FRACTIONS FROM MUSSEL FOR MEDICAL USE

Ulf S. E. Rothman, Västra Mellanvägen 2, Ljunghusen, S-236 00 Höllviksnäs, Sweden

PCT No. PCT/SE81/00130, § 371 Date Dec. 23, 1981, § 102(e) Date Dec. 23, 1981, PCT Pub. No. WO81/03124, PCT Pub. Date Nov. 12, 1981

PCT Filed Apr. 29, 1981, Ser. No. 336,400

Claims priority, application Sweden, Apr. 29, 1980, 8003253; Apr. 29, 1980, 8003256

Int. Cl.[4] C07G *7/00;* A61K *39/00, 35/56, 39/395*

U.S. Cl. 424—88 10 Claims

1. A vaccine against viral infections comprising an anti-viral amount of a polypeptide fraction isolated from the body fluids of the Mytilus species of mussels consisting essentially of a fraction of the body fluids which is capable of biospecifically binding at least one sialic acid in the presence of calcium ions, and wherein said fraction has been obtained by forming an extract of the Haemolymph from the mussel which was subjected to separation with regard to sialic acid binding capability, and a pharmaceutically acceptable carrier.

4,550,021

ANTITUMOR ANTIBIOTIC 81-484 AND PROCESS FOR ITS PRODUCTION

Iwao Umezawa, Tokyo, and Kanki Komiyama, Yokohama, both of Japan, assignors to The Kitasato Institute, Tokyo, Japan

Filed Jun. 5, 1984, Ser. No. 617,470

Claims priority, application Japan, Dec. 28, 1983, 58-245572

Int. Cl.[4] A61K *35/74;* C12P *1/06*

U.S. Cl. 424—122 1 Claim

1. Antibiotic 81-484 of the following physico-chemical properties:

(1) elementary analysis: $C_{33}H_{48}O_7$ (high resolution mass spectrum;

(2) molecular weight: 556 (Field desorption (FD) mass spectrum;

(3) melting point: not clear (oily at 10°–100° C.);

(4) specific rotation: $[\alpha]_D^{20} = -151°$ (c=0.1, methanol);

(5) ultraviolet absorption spectrum: shown in FIG. 1 (in methanol);

(6) infrared absorption spectrum: shown in FIG. 2 (KBr tablet);

(7) solubility:

insoluble in hexane and water,

soluble in diethyl ether, methanol, ethanol, dichloromethane, chloroform, ethyl acetate, butyl acetate, acetone and benzene;

(8) nuclear magnetic resonance spectrum: shown in FIG. 3 ($CDCl_3$, TMS);

(9) nature: acidic substance;

(10) color reaction:

negative for ninhydrin, anthrone-H_2SO_4 and ferric chloride reaction;

positive for iodine and antimony trichloride;

weakly positive for Zatkis reagent;

or a pharmacologically acceptable non-toxic salt thereof.

4,550,022

TISSUE IRRIGATING SOLUTION

Michael E. Garabedian, Arlington, and Robert E. Roehrs, Fort Worth, both of Tex., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 308,386, Oct. 5, 1981, Pat. No. 4,443,432. This application Feb. 22, 1984, Ser. No. 582,564

Int. Cl.[4] A61K *33/00, 33/14, 33/06, 33/10*

U.S. Cl. 424—127 16 Claims

1. A two-part tissue irrigating product comprising:

a stable, sterile prepackaged basic solution containing bicarbonate ions,

a stable, sterile prepackaged acidic solution containing dextrose, glutathione, calcium ions and magnesium ions,

at least one of said solutions containing sodium ions, at least one of said solutions containing potassium ions and at least one of said solutions containing chloride ions,

said acidic and basic solutions when mixed together forming the irrigating solution for irrigating body tissues during surgery, the irrigating solution containing between about 130 and about 180 mM/l sodium ions, between about 3 and about 10 mM/l potassium ions, between about 1 and about 5mM/l calcium ions, between about 0.5 and about 4 mM/l magnesium ions, between about 10 and about 50 mM/l bicarbonate ions, between about 2 and about 10 mM/l dextrose, and between about 0.03 and about 0.5 mM/l oxidized glutathione or the equivalent amount of reduced glutathione, and said irrigating solution having a pH of between about 6.8 and about 8.0 and an osmolality of between 250 and about 350 mOsm/kg.

4,550,023

METHOD AND FLOUR FOR PRODUCING SLICEABLE BREAD WITH A HIGH BRAN CONTENT

Hans Schoberth, Haus No. 9, D-8581 Harsdorf, Fed. Rep. of Germany

Continuation of Ser. No. 404,911, Aug. 3, 1982, abandoned. This application Aug. 23, 1984, Ser. No. 643,460

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1981, 3131432

Int. Cl.[4] A21D *10/00*

U.S. Cl. 426—19 11 Claims

1. A method of making leavened sliceable loaf bread from a dry flour having from 10 to 30% by weight soy bran, wherein said bread is easily sliced and can be covered with suitable spreads without difficulty, and wherein said bread has good crumb stability and is without a strawy taste comprising the steps of

(a) making a dough by mixing together the ingredients comprising bread cerealflour; water; leavening agents; soy bran in an amount equal to 10 to 30% by weight of the dough on a dry basis; and self-rising starch flour prepared from cereal or potato flour by heating said flour with water to form a starch paste, drying said paste, and grinding said dried paste, in an amount equal to 2 to 8% by weight of the dough on a dry basis;

(b) baking the dough to form bread.

4,550,024

APPARATUS FOR PREPARING HOT DRINKS

Josephus N. le Granse, Nieuwegein, Netherlands, assignor to Dowe Egberts Koninklijke Tabaksfabriek-Koffiebranderijen-Theehandel N.V., Utrecht, Netherlands

Filed Jan. 20, 1984, Ser. No. 572,373

Claims priority, application Netherlands, Jan. 20, 1983, 8300213

Int. Cl.[4] A47G *19/16;* A47J *31/00;* B65D *85/00*

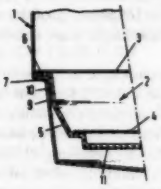
U.S. Cl. 426—77 5 Claims

1. Apparatus for multi-cup brewing of ground coffee comprising:

a reusable filter pan having an inwardly directed shoulder

and a part in the shape of a reverse truncated cone extending donwardly from said shoulder and

a disposable filter cartridge containing ground coffee having an upper outwardly directed flange which rests loosely on said shoulder thus supporting said filter cartridge without clamping said cartridge in said pan and a part in the shape of a reverse truncated cone extending downwardly from



said shoulder with an outside surface cooperating with and having substantially equal concavity as said filter pan part and slightly less radial diameter than said filter pan part the space between said parts is such that, when hot brewing water is poured into said pan and enters the space, a capillary seal is formed which prevents additional hot brewing water from thereafter bypassing said cartridge.

4,550,025

PACKAGED SMOKED FOODSTUFF

Cornelius M. F. Vrouenraets, Dieren, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

Division of Ser. No. 557,000, Dec. 1, 1983, Pat. No. 4,514,472. This application Dec. 12, 1984, Ser. No. 680,832

Claims priority, application Netherlands, Feb. 12, 1982, 8204674

Int. Cl.[4] A22C *13/00*; B32B *27/36*

U.S. Cl. 426—105 **14 Claims**

1. Smoked foodstuff packaged in a film which is permeable to smoke constituents, characterized in that the film entirely or substantially consists of a thermoplastic copolyester which is built up of recurrent long-chain and short-chain ester units which are joined head-to-tail through ester bonds, the long-chain ester units corresponding to the formula

$$-O-R_1-O-\overset{\overset{O}{\|}}{C}-R_3-\overset{\overset{O}{\|}}{C}-$$

and the short-chain ester units to the formula:

$$-O-R_2-O-\overset{\overset{O}{\|}}{C}-R_3-\overset{\overset{O}{\|}}{C}-$$

where R_1 is a divalent radical remaining after removal of the terminal hydroxy groups from a poly(alkylene oxide)glycol having a molecular weight in the range of 600 to 6000 and a carbon to oxygen ratio of 2.0 to 2.7; R_2 is a divalent radical remaining after removal of the hydroxyl groups from a diol having a molecular weight not higher than 250; R_3 is a divalent radical remaining after removal of the carboxylic acid groups from a dicarboxylic acid; with the proviso that said long-chain ester units amount to 20 to 60% by weight of the copolyester and at least 70% of the R_3 groups are 1,4-phenylene radicals, and the phenol number of the film, expressed in mg per m^2, is at least 20, the thickness of said film being in the range of 1 to 300 microns.

14. Smoked sausage of which the casing consists of a film which is permeable to smoke constituents, characterized in that the film entirely or substantially consists of a thermoplastic copolyester which is built up of recurrent long-chain and short-chain esters which are joined head-to-tail through ester bonds, the long-chain ester units corresponding to the formula:

$$-O-R_1-O-\overset{\overset{O}{\|}}{C}-R_3-\overset{\overset{O}{\|}}{C}-$$

and the short-chain ester units to the formula:

$$-O-R_2-O-\overset{\overset{O}{\|}}{C}-R_3-\overset{\overset{O}{\|}}{C}-$$

wherein R_1 is a divalent radical remaining after removal of the terminal hydroxyl groups from a poly(alkylene oxide)glycol having a molecular weight in the range of 600 to 6000 and a carbon to oxygen ratio of 2.0 to 2.7; R_2 is a divalent radical remaining after removal of the hydroxyl groups from a diol having a molecular weight not higher than 250; R_3 is a divalent radical remaining after removal of the carboxylic acid groups from a dicarboxylic acid; with the proviso that said long-chain ester units amount to 20 to 60% by weight of the copolyester and at least 70% of the R_3 groups are 1,4-phenylene radicals, and the phenol number of the film, expressed in mg per m^2, is at least 20, the thickness of said film being in the range of 1 to 300 microns.

4,550,026

METHOD FOR PRESERVING FOOD USING A PRESERVATIVE GAS ATMOSPHERE

Hiroshi Ando, Machida, Japan, assignor to Yosuke Akiba, Tokyo, Japan

Filed Feb. 15, 1983, Ser. No. 466,489

Int. Cl.[4] A23B *4/00*; A23L *3/34*; B65B *31/02*

U.S. Cl. 426—316 **6 Claims**

1. A method for preserving food over a period of time comprising the steps of:

placing a liquid mixture into a closed vessel defining a food preservation zone, said liquid mixture consisting essentially of a mixture of ethanol and from 0.01 to about 20 volume percent of a volatile aliphatic acid selected from the group consisting of acetic acid, propionic acid, butyric acid, isobutyric acid, valeric acid, isovaleric acid and caproic acid;

continually vaporizing at least a portion of said liquid mixture in said food preservation zone during said period of time to form an atmosphere in said zone having a food preservative effective amount of said liquid mixture vaporized therein; and

placing said food into said food preservation zone in contact with said atmosphere, but not in direct contact with said liquid mixture, said food being left in said food preservation zone during said period of time to provide preservation of said food over said period of time.

4,550,027

COFFEE MAKING

Wayne B. Stone, Jr., Bethesda, Md., assignor to Wood Manufacturing Co., Flippin, Ark.

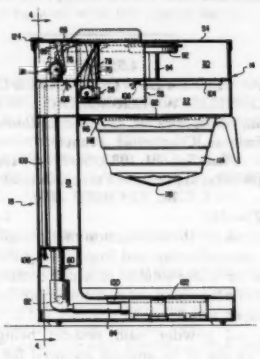
Division of Ser. No. 459,111, Jan. 19, 1983, Pat. No. 4,473,003. This application Jun. 7, 1984, Ser. No. 618,278

Int. Cl.[4] A23F *5/26*

U.S. Cl. 426—433 **4 Claims**

1. A method of making coffee comprising; introducing cold water to a coffee maker; heating and pumping the water to an elevated preheat tank with the coffee maker; maintaining the water in said preheat tank at an elevated temperature over a

substantial period of time; gravity flowing water in the preheat tank to an adjacent transfer tank in the coffee maker; and,



simultaneously, gravity flowing and metering water from said transfer tank to a filter basket.

4,550,028

METHOD OF RE-SUSPENDING FLOCCULATED MILK CASEIN TO OBTAIN PROTEIN ENRICHED DAIRY RAW MATERIAL

Jean Montigny, Folleville, France, assignor to Centrale Laitiere de Haute Normandie, Maronne, France

Filed Jun. 25, 1982, Ser. No. 392,144

Claims priority, application France, Jun. 25, 1981, 81 12523

Int. Cl.⁴ A23C *19/02*

U.S. Cl. 426—582 **14 Claims**

1. A method of resuspending a flocculated milk casein for obtaining a protein enriched dairy raw material comprising:

(a) subjecting a liquid milk to a combined acidifying and heating treatment to obtain a whey and a curd; said curd comprising casein in a flocculated state;

(b) separating the curd and whey; said whey containing substantially no milk proteins and said curd, containing substantially all the milk proteins including milk casein in the flocculated state; and

(c) resuspending the casein contained in said curd by compressing the curd at a pressure exceeding 100 bars by a compression device comprising a pumping means and at a temperature of between about 0° to 5° C., thereby obtaining a protein enriched dairy raw material in which the casein is resuspended in a colloidal state.

4,550,029

METHOD OF BOILING WORT

Roland Krüger, Dortmund, and Klaus Ehrlinger, Fründenberg, both of Fed. Rep. of Germany, assignors to Holstein & Kappert GmbH, Dortmund, Fed. Rep. of Germany

Continuation of Ser. No. 393,358, Jun. 29, 1982,. This application Jun. 7, 1984, Ser. No. 618,306

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1981, 3126714

Int. Cl.⁴ C12C *7/00, 9/00, 9/02*

U.S. Cl. 426—487 **3 Claims**

1. A method of continuous pressure-boiling of beer wort in a multistage column having an upright inner wall enclosing a head region near the top of the column, a sump region near the bottom of the column and a wort compartment between the head- and sump regions, the wort compartment including a plurality of superposed, substantially horizontal plates, each of the plates being provided with an overflow weir on its upper surface and with an opening between the overflow weir and the wall of the column, the plates communicating with each other and with the head- and sump regions via the openings to permit the wort to flow downward from plate to plate, the method comprising the steps of

preheating the wort in a regenerative preheating process;

feeding a heated gaseous medium into the sump region to heat the column to a process temperature;

continuously charging the preheated wort onto an upper plate in the wort compartment to establish a downward flow of the wort from one plate to another over the overflow weirs and through the openings while the gaseous medium rises through the openings causing intensive movement and bubble formation in the wort;

heating the wort during its descent to a boiling temperature by partial condensation of the rising gaseous medium whereby the wort is kept in boiling condition for such a period of time until the gaseous medium degasses the wort and frees the same from undesirable foreign substances; condensing in the head region vapors emanating from the processed wort due to the action of the gaseous medium and discharging the condensed vapors from the head region and the processed wort from the sump region.

4,550,030

METHOD FOR STRENGTHENING DENTAL RESTORATIVE MATERIAL

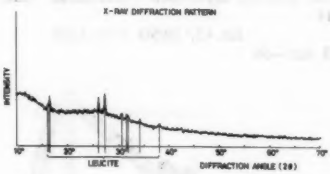
Nobukazu Ohi, Fuchu; Koji Ohno, and Hiroshi Kamohara, both of Tokyo, all of Japan, assignors to G-C Dental Industrial Corp., Tokyo, Japan

Filed Sep. 14, 1984, Ser. No. 650,544

Claims priority, application Japan, Jan. 26, 1984, 59-11034

Int. Cl.⁴ A01N *1/02*; C09K *3/00*

U.S. Cl. 427—2 **7 Claims**



1. A method for strengthening a dental restorative material, wherein the restorative material is obtained by coating and firing a dental porcelain fused to a metal material onto the surface of a dental alloy substrate, wherein the dental porcelain material contains leucite and sodium, said method comprising depositing at least one inorganic salt of a metal selected from rubidium, cesium, potassium or mixtures thereof on the surface of said coated material and heat treating the coated material at temperatures of 380° C. or higher, wherein said temperature is lower than the melting point of the inorganic salt and the strain temperature of the coated material.

4,550,031

CONTROL OF SI DOPING IN GAAS, (AL,GA)AS AND OTHER COMPOUND SEMICONDUCTORS DURING MBE GROWTH

Jonathan K. Abrokwah, Rosemount, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 26, 1984, Ser. No. 674,794

Int. Cl.⁴ B05D *3/06*

U.S. Cl. 427—10 **12 Claims**

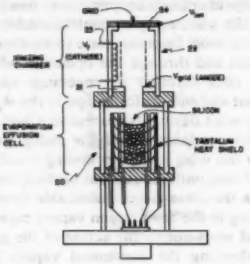
1. The method of measuring silicon dopant in the modulation doping of GaAs and (Al,Ga)As layers with silicon ions during molecular beam epitaxial growth, the method comprising the steps of:

forming in vacuum a molecular beam of semiconductor materials Ga, As and optionally Al;

epitaxially depositing said materials on a GaAs substrate from said molecular beam to form an epitaxial layer;

forming in said vacuum a low energy silicon ion (Si^+) beam for doping;

measuring the flux of said silicon ion beam to control the reproducibility of the doping; and,



directing said silicon ion beam to said epitaxial layer while said layer is being deposited.

4,550,032

ELECTRIC DISCHARGE TUBE AND METHOD OF MANUFACTURING AN ELECTRICALLY CONDUCTIVE LAYER ON A WALL PORTION OF THE ENVELOPE OF SUCH A TUBE

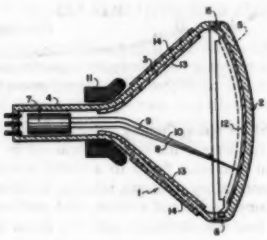
Johannes M. A. A. Compen, and Wilhelmus M. P. van Kemenade, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 1, 1984, Ser. No. 585,067

Claims priority, application Netherlands, Mar. 14, 1983, 8300914

Int. Cl.⁴ B05D *5/06, 5/12*

U.S. Cl. 427—64 **8 Claims**



1. A method of manufacturing an electrically conductive layer, comprising an electrically conductive material and at least 5% by weight of silicon dioxide as an adhesive, on a wall portion of an evacuated envelope of an electric discharge tube comprising the following steps:

(a) manufacturing a suspension comprising at least an electrically conductive material and a binder in a solvent,

(b) providing a layer of said suspension on a wall portion of said envelope, and

(c) drying said layer by heating and optionally firing said layer, characterized in that the binder is a quaternary ammonium silicate.

7. A method of manufacturing an electrically conductive layer, comprising an electrically conductive material and at least 5% by weight of silicon dioxide as an adhesive, on a wall portion of an evacuated envelope of an electric discharge tube comprising the following steps:

(a) manufacturing a suspension comprising at least an electrically conductive material and a binder in a solvent,

(b) providing a layer of said suspension on a wall portion of said envelope, and

(c) drying said layer by heating and optionally firing said layer, characterized in that the binder is a colloidal solution of silicon dioxide (SiO_2) in phosphoric acid (H_3PO_4) in which the mol ratio SiO_2/P_2O_5 is between 0.3:1 and 20:1.

4,550,033

FREE-FLOWING FLAKES OF HYDROPHILIC/WATER-SOLUBLE POLYMER GEL

Jean Boutin, Mions, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Jul. 20, 1983, Ser. No. 515,643

Claims priority, application France, Jul. 20, 1982, 82 12611

Int. Cl.⁴ B05D *7/00*

U.S. Cl. 427—222 **21 Claims**

1. A process for the production of a plurality of small, storage-stable, non-adhering and free-flowing flakes of a gel of a hydrophilic or water-soluble polymer coated with a thin adherent film of processing aid powder, comprising comminuting a larger shaped article of the polymer gel in the presence of a processing aid powder, said powder being present in an amount in excess of an amount required for otherwise complete coating of the flakes which result whereby burst grains or flakes are obtained, and said powder being inert with respect to the polymer and either water absorbent or adapted to prevent dehydration of the polymer gel.

4,550,034

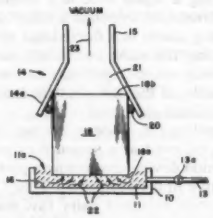
METHOD OF IMPREGNATING CERAMIC MONOLITHIC STRUCTURES WITH PREDETERMINED AMOUNTS OF CATALYST

Thomas Shimrock, Chatham, N.J.; R. Dirk Taylor, Northfield, and John M. Collins, Jr., Sagamore Hills, both of Ohio, assignors to Engelhard Corporation, Iselin, N.J.

Filed Apr. 5, 1984, Ser. No. 596,993

Int. Cl.⁴ B05D *5/00*

U.S. Cl. 427—243 **17 Claims**



1. A method of impregnating the interior skeletal structure of a ceramic monolithic catalyst support member with a slurry of coating material solids suspended in a volatile liquid component which comprises:

metering a predetermined amount of the coating slurry into contact with a first end of the monolithic support member, said predetermined amount of slurry being determined in accordance with the formula:

Volume of substrate (cu. in.) times Dry Gain (gms/cu. in.) divided by % solids in slurry/100

where,

Volume of substrate is the internal cross-sectional area multiplied by the height of the monolithic member, and

Dry Gain is the amount of solid coating material remaining on the interior skeletal structure of the support member after removal of the volatile liquid component from the slurry metered into contact with the support member,

placing a cover over the periphery of the opposite end of the monolithic support member in sealing relation thereto to define a vacuum chamber adjacent the opposite end of the support member, and then

drawing a vacuum on the cover to draw coating slurry into the skeletal structure from the opposite end of the monolithic support whereby the interior skeletal structure is uniformly impregnated with the coated slurry.

4,550,035

COSMETIC APPLICATOR USEFUL FOR SKIN MOISTURIZING AND DEODORIZING

James A. Smith, Old Tappan, N.J., assignor to Creative Products Resource Associates, Ltd., Clifton, N.J.

Division of Ser. No. 448,806, Dec. 10, 1982, Pat. No. 4,462,981. This application Jun. 28, 1984, Ser. No. 605,054

Int. Cl.[4] A47K *7/02, 7/03;* **B32B** *5/18*

U.S. Cl. 427—398.1 **6 Claims**

1. A method for preparing a substantially dry cosmetic applicator, comprising:

(a) forming a stirred melt of at least one emollient;

(b) adding dry absorbent particles of at least one water-insoluble moisture-absorbent agent and at least one water-insoluble oil-absorbent agent to the melt;

(c) adding fragrance to the melt forming a cosmetic composition;

(d) cooling the composition; and

(e) applying the composition so as to impregnate a sheet of absorbent material.

4,550,036

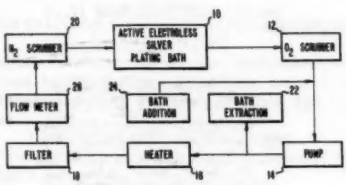
ELECTROLESS SILVER PLATING PROCESS AND SYSTEM

Frank A. Ludwig, Rancho Palos Verdes, and Carlyle L. Helber, Jr., Fountain Valley, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Oct. 18, 1984, Ser. No. 662,110

Int. Cl.[4] B05D *1/18*

U.S. Cl. 427—443.1 **10 Claims**



1. A process for electroless plating to deposit a layer of silver onto a substrate, said process comprising the steps of:

(a) passing an active electroless silver plating solution capable of autocatalytically plating said silver onto a substrate, through a plating zone wherein said active electroless silver plating solution is maintained at a sufficient temperature and resides within said plating zone for a sufficient time to provide autocatalytic plating of said silver onto said substrate located within said plating zone to form a silver plating layer on said substrate;

(b) removing said active electroless silver plating solution from said plating zone and exposing said active electroless silver plating solution to a sufficient amount of an oxygen-containing gas to provide a controlled level of oxygen therein and thereby provide a stabilized silver solution;

(c) passing said stabilized silver solution to a scrubber zone;

(d) exposing said stabilized silver solution in said scrubber zone to a scrubber gas capable of displacing said oxygen from said stabilized silver solution for a sufficient time to reduce the amount of said oxygen in said stabilized silver solution to a level sufficient to regenerate said active electroless silver plating solution; and

(e) recycling said active electroless silver plating solution from said scrubber zone to said plating zone wherein the rate of autocatalytic plating and the physical characteristics of said silver plating layer are controlled by varying the amount of said oxygen removed from said stabilized silver solution in said scrubber zone.

8. An electroless plating system adapted for the autocatalytic deposition of a silver layer onto a substrate comprising:

(a) a vessel defining a plating zone through which is passed an active electroless silver plating solution capable of autocatalytically plating said silver onto a substrate, said vessel including an inlet and an outlet;

(b) means associated with said vessel outlet for removing said active electroless silver plating solution from said plating zone;

(c) means for exposing said active electroless silver plating solution removed from said plating zone to an oxygen-containing gas to provide a controlled level of oxygen in said active solution and thereby produce a stabilized silver solution;

(d) scrubber means for exposing said stabilized silver solution to a scrubber gas capable of displacing said oxygen from said stabilized silver solution to reduce the amount of said oxygen in said stabilized silver solution to produce said active electroless silver plating solution;

(e) means for transferring said stabilized silver solution from said means for exposing to said scrubber means; and

(f) means for recycling said active electroless silver plating solution from said scrubber means to said inlet of said vessel for electroless plating of said silver onto said substrate wherein the rate of autocatalytic silver plating and the physical characteristics of said silver layer are controlled in part by varying the amount of said oxygen removed from said stabilized silver solution by said scrubber means.

4,550,037

TIN PLATING IMMERSION PROCESS

Edmund W. Kinkelaar, Dublin, and Howard G. Pekar, Columbus, both of Ohio, assignors to Texo Corporation, Cincinnati, Ohio

Filed Dec. 17, 1984, Ser. No. 682,749

Int. Cl.[4] B05D *1/18*

U.S. Cl. 427—443.1 **7 Claims**

1. In a method for coating an electro-conductive substrate with tin, the steps of (1) immersing the substrate to be coated and one or more pieces of metallic zinc in a bath having the following composition:

(a) approximately 3 to 70 grams of stannous ions per liter of water;

(b) approximately 10 to 200 grams of a strong mineral acid per liter of water, the concentration of said acid being sufficient to maintain the stannous ions in solution in the bath; and

(c) 0.1 to 10 grams of nonylphenoxy-poly (ethyleneoxy) ethanol having a molecular weight ranging from about 484 to 2400.

(2) effecting electro-conductive contact between the substrate to be coated and the metallic zinc immersed in said bath for a pre-determined length of time related to the thickness of the tin coating to be deposited on the substrate; (3) operating said bath at a temperature between approximately 50 to 110 degrees F.; (4) removing the substrate coated with tin from the bath.

4,550,038

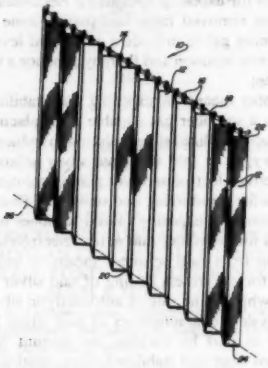
DRAPERY

William A. Becker, 87 Piermont Ave., Hillsdale, N.J. 07642; Richard A. Marlow, 703 Butternut Dr., Franklin Lakes, N.J. 07417, and William I. Schlags, 2100 Linwood Ave., Apt. 8L, Fort Lee, N.J. 07024

Continuation-in-part of Ser. No. 502,713, Jun. 9, 1983, , and Ser. No. 502,646, Jun. 9, 1983, , and a continuation-in-part of Ser. No. 451,033, Dec. 20, 1982,. This application Oct. 3, 1983, Ser. No. 538,564

Int. Cl.[4] A47H *23/00*

U.S. Cl. 428—12 8 Claims



1. A drapery comprising:

a plurality of parallel rigidized fabric panels,

hinge means, hingedly joining adjacent panels to each other along their adjacent edges;

wherein adjacent panels are hingedly joined to each other by a length of hinge fabric extending along the length of adjacent edges of the panels, said hinge fabric being threads of the fabric panels and forming a continuum therewith, said hinge fabric density being less than the fabric panels; and

means for hanging said drapery on a curtain rod,

wherein when the drapery is folded, adjacent panels fold one upon the other, and when the drapery is extended, adjacent panels form a continuous drapery.

4,550,039

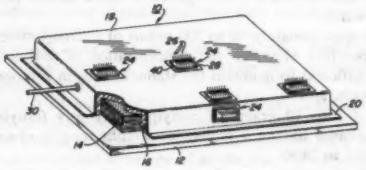
METHOD AND APPARATUS FOR MAKING ELECTRIC CONNECTIONS INTO A COMPLIANT SEALED PACKAGE

David Glaser, Northbrook, and Charles J. Whelchel, Prospect Heights, both of Ill., assignors to Lucitron, Inc., Northbrook, Ill.

Filed Mar. 1, 1984, Ser. No. 585,238

Int. Cl.[4] H01J *61/06, 61/30, 9/26*

U.S. Cl. 428—13 8 Claims



1. A method of fabricating an electrical device containing a display-producing structure located within a sealed enclosure, said display-producing structure including an electrical element, comprising the steps of

providing a hermetic seal between a conductive element and a gas-impervious support member through which said conductive element extends,

positioning said support member over an opening in a foil sheet,

hermetically sealing said support member to said foil sheet throughout a continuous area of said foil sheet surrounding said opening,

electrically connecting said electrical element to said conductive element,

mounting said display-producing structure in proximity to a rigid, gas-impervious translucent member,

sealing said foil sheet to said gas-impervious translucent member to define in conjunction with said gas-impervious translucent member a sealable cavity in which said display-producing structure is disposed, and

reducing the pressure in said cavity below ambient pressure.

4,550,040

MOVABLE MOSAICS

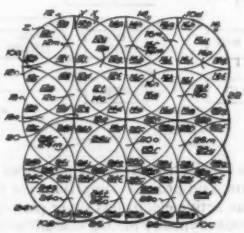
Denys Fisher, Glencaple, England, assignor to Waddingtons Games Limited, Leeds, England

Filed Mar. 29, 1983, Ser. No. 480,059

Claims priority, application United Kingdom, Mar. 31, 1982, 8209571

Int. Cl.[4] A63F *9/08;* B44F *11/04*

U.S. Cl. 428—33 5 Claims



1. A movable mosaic comprising a plurality of substantially flat pieces defining at least two circles of the same radius, the pieces within each circle being rotatable about the center of the circle, all edges of the pieces making up each of said circles being defined by arcs of circles of said radius and within each circle there are defined by said edges (a) only four first arcs which pass through the center of the circle and which are equally angularly spaced relative to the circle, and (b) only four second arcs which are equally angularly spaced relative to the circle and which meet the circumference of the circle at right angles at locations which respectively bisect circumference sections subtended by said first arcs, said circles overlapping by an amount equal to said radius so that as regards any two overlapping circles, the circumference of each circle is partly defined by at least one of the first and second arcs of each adjacent circle, whereby any part of one circle can be moved into the corresponding portion in the other circle by sequentially rotating the circles.

4,550,041

ARTICLE CONTAINING A THIXOTROPIC ADDITIVE AND CYANOACRYLATE MONOMER EMPLOYED FOR DEVELOPING LATENT FINGERPRINTS

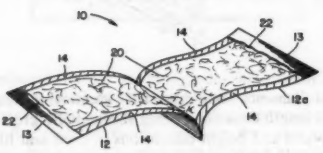
Richard T. Thompson, Haddam View Heights; Philip Hinkle, West Hartford, both of Conn., and Robert B. Carroll, South Paris, Me., assignors to Loctite Corporation, Newington, Conn.

Division of Ser. No. 743,585, filed as PCT/US84/01354, Aug. 24,1984, published as WO85/00963, Mar. 14, 1985, § 102(e) date Oct. 7, 1984.

Filed Dec. 14, 1984, Ser. No. 681,961

Int. Cl.[4] A61B *5/10*; B41K *1/00*

U.S. Cl. 428—35 8 Claims



1. An article for rapid room temperature generation of cyanoacrylate monomer vapors comprising an envelope containing a storage stable composition of a cyanoacrylate monomer and a thixotropic additive in an amount effective to render the composition substantially non-flowable on a vertical surface, the envelope defined by a pair of opposed sheets of a material having an inner plastic film surface, said sheets being sealed together along the edges thereof in a manner adapted to permit separation of the sheets by tearing or peeling along the edges thereof so as to expose the inner sheet surfaces coated with a film of said composition.

4,550,042

SHIRRED SAUSAGE CASING AND PROCESS FOR ITS MANUFACTURE

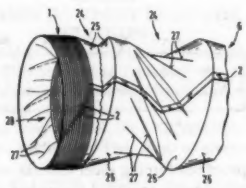
Klaus Andrae, Zornheim, and Elfriede Hutschenreuter, Bad Schwalbach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 25, 1983, Ser. No. 516,984

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1982, 3228675

Int. Cl.[4] A22C *13/02*

U.S. Cl. 428—36 11 Claims



1. A shirred tubular sausage casing in the form of a hollow cylinder, comprising:

an internal hollow space having a substantially circular cross-section;

a strip-shaped area of increased thickness helically arranged about the longitudinal axis of the casing;

a continuous helical main-fold structure of individual windings constituting the outside of said hollow cylinder; and

a secondary fold structure having fold-lines which are arranged to form a continuous zig-zag line between said windings of said main-fold structure, wherein said strip-shaped area has a minimum width of about 1 mm and a maximum width amounting to about 10% of the circumference of the casing in the unshirred state and extends transversely to said main fold structure being displaced by its width with a tolerance of not more than about 10% of its width in the circumferential direction of the shirred casing between two consecutive main-fold windings.

4,550,043

PREFORM WITH INTERNAL BARRIER AND INTERNAL LAYER OF HIGH THERMAL STABILITY AND PRODUCTS MADE FROM THE SAME

Martin H. Beck, Brookline, N.H., assignor to Continental Plastic Containers, Inc., Stamford, Conn.

Filed Feb. 17, 1984, Ser. No. 581,148

Int. Cl.[4] B65D *23/00*

U.S. Cl. 428—36 20 Claims

1. A laminated preform for forming blow molded articles and the like, said preform being injection molded and including a tubular wall having inner and outer surfaces, said tubular wall in radial cross section comprising inner and outer first layers of a thermoplastic resin, inner and outer layers of a barrier material next to and between said inner and outer first layers, and a second layer of thermoplastic resin between said barrier material layers, said second layer of thermoplastic material being a thermoplastic having high temperature thermal stability.

4,550,044

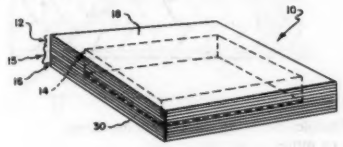
BALLISTIC RESISTANT ARMOR PANEL AND METHOD OF CONSTRUCTING THE SAME

Isadore Rosenberg, Downey, and William K. Ansite, Glendale, both of Calif., assignors to Figgie International, Inc., Willoughby, Ohio

Filed Aug. 8, 1983, Ser. No. 521,125

Int. Cl.[4] B32B *3/06*

U.S. Cl. 428—101 13 Claims



1. A ballistic resistant panel comprising:

a first layer including a plurality of plies of resin-impregnated fabric;

a second layer including at least one ply of flexible woven fabric supported adjacent said first layer; and

a third layer including at least one ply of resin-impregnated fabric supported adjacent said second layer opposite said first layer, said second layer being smaller in area than said first and third layers, said first and third layers each having a central portion and a marginal portion which borders said central portion, said second layer being positioned between said central portions of said first and third layers and said marginal portions being bonded together whereby said second layer is encapsulated between said first and third layers.

4,550,045

BIASED MULTI-LAYER STRUCTURAL FABRIC COMPOSITES STITCHED IN A VERTICAL DIRECTION

Harold K. Hutson, Seguin, Tex., assignor to Knytex Proform, Seguin, Tex.

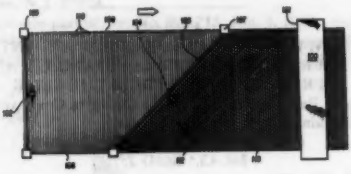
Division of Ser. No. 536,734, Sep. 28, 1983, Pat. No. 4,484,459. This application Oct. 12, 1984, Ser. No. 660,366

Int. Cl.[4] B32B *3/06*

U.S. Cl. 428—102 10 Claims

1. A multi-layer non-woven structural fabric comprised of at

least a top, middle and bottom layer, each of substantially parallel structural fibers, each of said layers being free of secondary fibers in the plane of said layer designed to maintain parallelity,



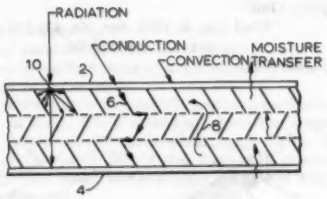
vertical stitching normal to said layers and passing therethrough to maintain said layers in said vertical relationship and the parallelity of fibers within each layer,
wherein at least one of said layers is biased.

4,550,046

INSULATING MATERIAL

Stephen D. Miller, 2748 Via Anita, Palos Verdes Estates, Calif. 90274

Continuation-in-part of Ser. No. 504,600, Jun. 20, 1983, abandoned, which is a continuation of Ser. No. 360,402, Mar. 22, 1982, abandoned. This application Aug. 7, 1984, Ser. No. 638,427
Int. Cl.[4] B32B *3/12*
U.S. Cl. 428—116 **11 Claims**



1. A flexible insulating material comprising:
a. one or more cover sheets; and
b. at least one sheet of polymeric material formed into a three dimensional layer with a regular pattern of contiguous honeycomb like cells which are formed with angularly offset walls;
c. said cells having an overall cell height to cell width ratio greater than 4;
d. the cell walls are inclined to an angle greater than 10 degrees as measured from the normal to the plane of a cover sheet;
e. the cellular layers being flexibly disposed between the cover sheets forming a sandwich type assembly.

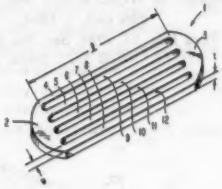
4,550,047

SILICON SOURCE COMPONENT FOR USE IN MOLECULAR BEAM EPITAXIAL GROWTH APPARATUS

Thomas N. Jackson, Peekskill; Peter D. Kirchner, Crompond; George D. Pettit, Mahopac; James J. Rosenberg, Bronx; Jerry M. Woodall, Bedford Hills, and Steven L. Wright, Yorktown Heights, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 6, 1983, Ser. No. 501,571
Int. Cl.[4] B32B *3/10*; C30B *23/04*
U.S. Cl. 428—136 **6 Claims**

1. A source component for use in a molecular beam epitaxial growth apparatus wherein elemental silicon that is to be incorporated in the grown crystal is converted into a molecular beam which delivers an atom flux of silicon in contact with the growing crystal surface said silicon source component comprising in combination;
a monocrystalline silicon member in wafer shape
having first and second broad area electrical contact receiving regions,
said contact receiving regions being connected to each other through a plurality of electrically parallel filaments,



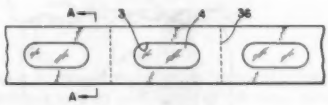
said filaments being essentially identical in length,
said length dimension being substantially greater than the width and height dimensions of each said filament,
each said filament being separated from an adjacent filament by a slot that passes completely through said wafer.

4,550,048

DUST-PROOF REINFORCING SHEET MATERIAL TO BE APPLIED OVER HANDLING OPENING-FORMED ON WALL OF BOX

Yasuyuki Nakagawa, Hirakata, Japan, assignor to Asahi Kakoshi Co., Ltd., Osaka, Japan

Filed Sep. 28, 1983, Ser. No. 536,936
Int. Cl.[4] B65D *5/46*, *25/30*
U.S. Cl. 428—138 **8 Claims**



1. A dust-proof reinforcing sheet material to be applied over and around an opening provided through a wall of a box for handling the box, said sheet material comprising a base sheet having a row of through-holes punched out to be arranged equidistant apart, an adhesive layer applied on one side of said base sheet, and an elastic film applied on the other side of said base sheet to extend over said through-holes, said elastic film being stretchable to have an area of five times or more of the orignial surface area thereof so that the film is stretched to permit easy insertion of fingers of a handler when the handler desires to handle the box, and said elastic film being transparent or translucent to allow light rays to transmit therethrough so that the position of the sheet material may be sensed by photo-sensor means and the sheet material is cut at a precise position.

4,550,049

LAMINATED FILM AND MAGNETIC RECORDING MEDIUM MADE THEREWITH

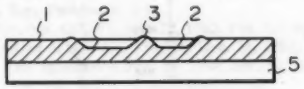
Masaaki Ono, Omihachiman; Yasuki Miura, Otsu; Masahiko Motegi, Hikone, and Kazuo Okabe, Shiga, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Mar. 9, 1983, Ser. No. 473,449

Claims priority, application Japan, Mar. 10, 1982, 57-36341; Mar. 11, 1982, 57-38763

Int. Cl.[4] G11B *5/72;* B32B *3/00*

U.S. Cl. 428—141 27 Claims



1. A laminated film for use in high-density, metallized magnetic recording media comprising (A) a layer composed of a thermoplastic resin and (B) a layer of a thermoplastic resin containing fine particles therein, wherein the outer surface of the layer (A) has a discontinuous skin having a height of 50 to 1,000Å, said discontinuous skin comprising a silicone resin, a silane coupling agent which is an organic silicon monomer having at least two different reactive groups in the molecule, and a water-soluble polymer having a molecular weight of from 10,000 to 2,000,000, wherein the ratio by weight of silicone resin/silane coupling agent/water-soluble polymer is in the range of (10–50)/ (5–150)/(10–200); wherein the outer surface of the layer (B) has a roughness, expressed as the Ra value, of 0.005 to 0.040μ.

4,550,050

FIBEROUS BATT

George S. Buck, Jr., Memphis, Tenn., assignor to Fiberlok, Inc., Memphis, Tenn.

Division of Ser. No. 339,627, Jan. 15, 1982, Pat. No. 4,457,793. This application Mar. 21, 1984, Ser. No. 579,511

Int. Cl.[4] D04H *1/58*

U.S. Cl. 428—283 2 Claims

1. A fibrous batt, the individual fibers of which are bonded at their intersection by melted and refrozen particles of a copolymer of vinyl chloride and a diester of vinyl unsaturated dicarboxylic acid wherein the diester is maleic acid dibutyl ester.

4,550,051

LAMINATE BASED ON EPOXY RESIN FOR PRINTED CIRCUITS

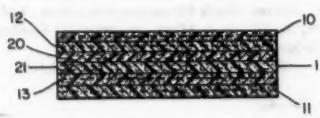
Paul Spielau, Troisdorf-Eschmar; Helmut Fassbender, Bergisch-Gladbach, and Richard Weiss, Troisdorf, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisorf, Fed. Rep. of Germany

Filed May 4, 1984, Ser. No. 606,956

Claims priority, application Fed. Rep. of Germany, May 5, 1983, 3316362

Int. Cl.[4] B32B *15/04, 17/04, 27/38*

U.S. Cl. 428—285 12 Claims



1. A laminate based on epoxy resin for preparation of printed circuits, which comprises a multilayered composite having epoxy resin-impregnated, outer plies containing a substrate of glass fibers and at least one epoxy resin-impregnated core ply containing a flat textile form of synthetic thermoplastic fibers, each substrate containing glass fibers having a weight per unit area of 70–350 g/m^2 and each flat textile form containing synthetic thermoplastic fibers having a weight per unit area of about 100–400 g/m^2; said composite having a dielectric constant ϵ_r at 20° C. and 10^6 Hz of smaller than 5, a dissipation factor tan δ at 20° C. and 10^6 Hz of smaller than 0.05, and a water absorption when stored in cold water according to DIN 53 472 of smaller than 30 mg/4 d; the outer plies containing a substrate of glass fibers having an epoxy resin content of about 40 to 65% by weight and the at least one core ply containing a flat textile form having an epoxy resin content of about 45–85% by weight.

4,550,052

GRAVEL-RESISTANT SELFADHESIVE DECORATIVE FILM

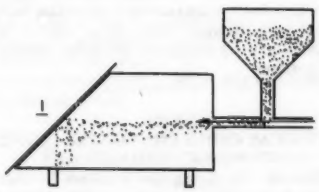
Wasfi N. Malek, Hamburg, Fed. Rep. of Germany, assignor to Beiersdorf Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Filed Apr. 21, 1983, Ser. No. 487,429

Claims priority, application Fed. Rep. of Germany, May 25, 1982, 3219645

Int. Cl.[4] B32B *5/16, 27/10;* C09J *7/02*

U.S. Cl. 428—323 7 Claims



1. A gravel-resistant selfadhesive decorative film which consists of

(a) a thermoformable base of a calendered EVA-PVC copolymer film 80–900 μm thick, which is

(b) coated with a polyurethane primer on which is applied

(c) a shearing-resistant, aging-resistant acrylate selfadhesive composition on which is present

(d) a covering of release paper or release film.

4,550,053

RECORDING MEDIUM

Ryuichi Arai, and Shigeo Toganoh, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1984, Ser. No. 592,300

Claims priority, application Japan, Mar. 24, 1983, 58-47997

Int. Cl.[4] B41M *5/00*

U.S. Cl. 428—304.4 7 Claims

1. A medium for recording with ink comprising a substrate and an ink-receiving layer provided on said substrate, said ink-receiving layer including a D-sorbitol-benzaldehyde condensation product and a resin.

4,550,054

MAGNETIC RECORDING MEDIUM

Yasuhisa Yamauchi, Hino; Masao Asano, Tokyo, and Mitsutaka Arai, Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 27, 1983, Ser. No. 545,960

Claims priority, application Japan, Oct. 29, 1982, 57-190273; Nov. 8, 1982, 57-195605

Int. Cl.[4] G11B 5/70

U.S. Cl. 428—328 22 Claims

1. A magnetic recording medium comprising a non-magnetic substrate, a magnetic layer comprising ferromagnetic particles, a binder group, and a titanate coupling agent, said binder group consisting at least one polyurethane resin and at least one of a nitrocellulose resin and an epoxy resin, and wherein said titanate coupling agent has 6 ligands, each of said ligands being free of ethylenically unsaturated double bonds.

4,550,055

TITANIUM CHELATE MODIFIED NYLON MAGNET WIRE INSULATION COATING

Francois A. Lavallee, Fort Wayne, Ind., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Oct. 12, 1984, Ser. No. 660,197

Int. Cl.[4] B32B 27/00; H01B 7/00

U.S. Cl. 428—383 7 Claims

1. An electrically insulated magnet wire insulated with at least one layer of an enamel composition comprising nylon reacted with titanium chelate in an amount of about 0.25% to about 20% by weight of the nylon present in the enamel composition.

5. An electrically insulated magnet wire insulated with a layer of polyurethane which is bonded to a layer of polyvinyl butyral through a layer of an enamel composition comprising nylon reacted with titanium chelate in an amount of about 0.25% to about 20% by weight of the nylon present in the enamel composition.

4,550,056

ELECTRICAL CABLE CONTAINING CURED ELASTOMERIC COMPOSITIONS

Robert J. Pickwell, Mt. Kisco, and Frederick D. Osterholtz, Pleasantville, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 485,301, Apr. 15, 1983, Pat. No. 4,526,922. This application Feb. 11, 1985, Ser. No. 700,313

Int. Cl.[4] B32B 11/06; H01B 7/00

U.S. Cl. 428—391 4 Claims

1. An electrical cable comprising a conductor and a coating of insulation on said conductor said coating comprising a cured composition comprising:

(1) an organic elastomer;

(2) an inorganic filler;

(3) a coupling composition comprising:

(a) 5 to 95 wt. % of an ethylenically unsaturated silane selected from the group consisting of vinyltriethoxysilane, vinyltrimethoxysilane and gamma-methacryloxypropyltrimethoxysilane;

(b) 95 to 5 wt. % of a methyl ethoxy siloxane fluid having an average molecular weight of about 500, having an ethoxy content of 35 to 55 wt. %, and having the formula:

$$C_2H_5O[(CH)_3(C_2H_5O)SiO]_xC_2H_5$$

in which x is an integer of about 10; and

(c) 0 to 10 wt. % of methylvinyl siloxane fluid having the formula:

$$C_{12}H_{25}O[(CH_3)(CH_2{=}CH)SiO]_yC_{12}H_{25}$$

wherein y is an integer of 4 to 20; and

(4) a peroxide capable of crosslinking said organic elastomer.

4,550,057

ACRYLIC SHEETS

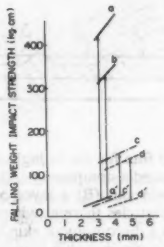
Hiroshi Kataoka, Tokyo, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

Filed Mar. 30, 1983, Ser. No. 480,350

Claims priority, application Japan, Apr. 1, 1982, 57-52283

Int. Cl.[4] B32B 27/30; B29C 17/04; B22D 19/04

U.S. Cl. 428—215 5 Claims



1. A tough acrylic sheet having a smooth surface and a thickness of 1 to 10 mm, which is composed of an ultra-high-molecular-weight methyl methacrylate polymer having a weight average molecular weight of at least 1,000,000 and being biaxially oriented at an area stretch ratio of at least 3 and which has a maximum orientation release stress of at least 20 kg/cm^2.

4,550,058

SOFT TOP COATED SHAPED POLYCARBONATE ARTICLE

Patrick C. Collins, and John M. Gasaway, both of Pittsfield, Mass., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Oct. 31, 1983, Ser. No. 547,344

Int. Cl.[4] B32B 27/36, 27/10, 27/08

U.S. Cl. 428—412 12 Claims

1. A soft top coated shaped polycarbonate article exhibiting improved protection of the polycarbonate to degradation by the plasticizers contained in the soft top coating comprising:

(i) a shaped substrate containing a polycarbonate resin;

(ii) an intermediate layer disposed on said polycarbonate containing substrate exhibiting plasticizer barrier properties, compatibility with the polycarbonate, thermoformability, thermoplasticity, and heat resistance up to about 235° F.; and

(iii) a relatively soft plasticized top coat comprised of at least one resinous material and at least one plasticizer disposed on said intermediate layer.

4,550,059

METHOD OF FORMING A TINTABLE ABRASION-RESISTANT COATING ON A SUBSTRATE AND ARTICLE PRODUCED THEREBY

Jeffrey L. Dalton, North Grosvenordale, Conn., and Philip M. Johnson, Southbridge, Mass., assignors to Gentex Corporation, Carbondale, Pa.

Filed Aug. 4, 1983, Ser. No. 520,459

Int. Cl.[4] B05D 3/06

U.S. Cl. 428—409 27 Claims

1. A method of forming a tintable abrasion-resistant coating on an optical substrate including the steps of applying a radiation-curable optically transparent abrasion-resistant coating to the surface of said substrate, partially curing said applied coating by exposure to radiation, and terminating said exposure to

radiation while said coating is in such a stage of partial cure that it remains tintable.

8. An article of manufacture comprising an optical substrate and a radiation-curable, optically transparent abrasion-resistant coating thereon partially cured by exposure to radiation, said coating being in such a stage of partial cure that it remains tintable.

4,550,060

COATED ARTICLE

Joseph M. Makhlouf, Mars; Gregory J. McCollum, Glenshaw, and Paul R. Kerr, Allison Park, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 427,397, Sep. 29, 1982, Pat. No. 4,477,405, which is a division of Ser. No. 336,226, Dec. 31, 1981, Pat. No. 4,425,468. This application Jun. 29, 1984, Ser. No. 626,515

Int. Cl.[4] B32B *27/40;* **C08G** *18/12*

U.S. Cl. 428—423.1 **10 Claims**

1. An article having a coating on its outer surface which substantially and uniformly covers the surface, the coating comprising an at least partially cured coating composition which comprises a dispersion of the following ingredients in an ethylenically unsaturated monomer:

(i) a polymerizable ethylenically unsaturated urea-urethane polymer prepared by a process, which comprises:

A. reacting a polyisocyanate, at least a portion of which is a diisocyanate, with a polyfunctional amine containing primary and/or secondary amino groups in the presence of a polyol, at least a portion of which is a polymeric polyol, free of ethylenic unsaturation and a diluent which is an ethylenically unsaturated compound free of active hydrogens, the equivalent ratio of isocyanate to active hydrogen in said polyol and said polyfunctional amine being within the range of 1.1 to 2.0/1 and the equivalent ratio of polyol to polyfunctional amine being within the range of 0.75 to 20/1, under conditions sufficient to form an NCO group-containing polyurea-polyurethane dispersed in an ethylenically unsaturated compound; followed by

B. reacting the NCO group-containing polyurea-polyurethane dispersion with an active hydrogen-containing polymerizable ethylenically unsaturated compound under conditions sufficient to react the NCO-functionality with the active hydrogens thereby forming the polymerizable ethylenically unsaturated urea-urethane polymer dispersion;

(ii) a catalyst, and

(iii) a mold release agent.

4,550,061

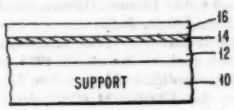
ELECTROEROSION PRINTING MEDIA USING DEPOLYMERIZABLE POLYMER COATINGS

Krishna G. Sachdev, Wappingers Falls; Stephen A. Shear, Rosendale; Keith S. Pennington, Somers, and Mitchell S. Cohen, Ossining, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 13, 1984, Ser. No. 599,875

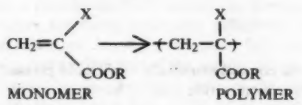
Int. Cl.[4] B32B *15/08, 27/06, 27/08*

U.S. Cl. 428—461 **20 Claims**



1. An improved electroerosion recording medium comprising a non-conductive support member, a thin layer of conductive material which is removed during electroerosion recording, and a base layer located between said support member and said thin layer of conductive material, said base layer being comprised of a thermally depolymerizable, high molecular weight polymer having a glass transition temperature greater than about 100° C. which undergoes thermally-induced, main-chain-scission during electroerosion recording to monomeric or low molecular weight species with little or no residue, where said depolymerizable polymer is selected from the group consisting of

(a) polymers derived from acrylate monomers having a substituent in the 2-position of the double bond as represented by the following structure:



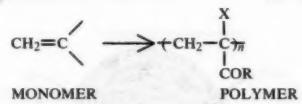
where

X=—CH_3, —CF_3, —C_2H_5, —C_6H_5

R=—H, —CH_3, —$CH_2CH_2CH_2CF_3$, —$CH_2C_6H_5$, —C_2H_5, —C_6H_5

(b) α-Substituted styrene polymers,

(c) polymers derived from vinyl ketone monomers, given by the structure



where

X=—CH_3, —C_6H_5, —CH_2CH_3,

R=—CH_3, —CH_2CH_3, —C_6H_5

(d) Polyoxymethylene.

2. The medium of claim 1, where said thin conductive layer is comprised of a metal.

4,550,062

MAGNETIC RECORDING MEDIUM

Suguru Takayama; Kiyoshi Noguchi, and Kouji Kobayashi, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Dec. 15, 1983, Ser. No. 561,521

Claims priority, application Japan, Dec. 25, 1982, 57-234812

Int. Cl.[4] G11B *5/66*

U.S. Cl. 428—611 **24 Claims**

1. A magnetic recording medium which comprises a first layer formed on a substrate and comprising Co; Co and Ni; Co and O; or Co, Ni and O, and a second magnetic layer formed on the first magnetic layer and comprising Co and Cr at a weight ratio of Co/Cr being from 2.5 to 8.

4,550,063

SILICON NITRIDE REINFORCED NICKEL ALLOY COMPOSITE MATERIALS

Francis S. Galasso, Manchester, and Richard D. Veltri, East Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

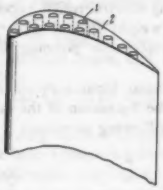
Filed Apr. 17, 1984, Ser. No. 601,206

Int. Cl.[4] C04B *35/58;* **B32B** *15/04*

U.S. Cl. 428—614 **2 Claims**

1. An erosion resistant composite material consisting essentially of nickel alloy reinforced with a plurality of silicon nitride rods or bars wherein the rods or bars are cold pressed, sintered, high density silicon nitride consisting essentially of, in weight percent, polycrystalline silicon nitride about 15%

yttria, about 5% silica, and about 3% to about 8% alumina, wherein about 5% to about 50% of the cross-sectional area of



the composite consists essentially of the cold pressed, sintered, high density silicon nitride rods or bars.

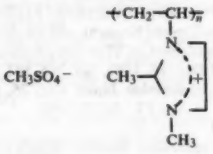
4,550,064

HIGH CYCLE LIFE SECONDARY LITHIUM BATTERY

Shiao-Ping S. Yen, Altadena; Boyd J. Carter, S. San Gabriel; David H. Shen, Rosemead, and Robert B. Somoano, LaCanada, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Dec. 8, 1983, Ser. No. 559,345
Int. Cl.[4] H01M *4/00*
U.S. Cl. 429—94 **15 Claims**

1. A separator for use in a battery comprising a sheet of hydrophobic, porous elastomer polymer material containing a surface film of a poly-alkenyl imidazoline containing a repeating unit of the formula:



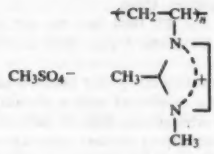
where R is slected from H, alkyl of 1 to 5 carbon atoms or phenyl.

5. A battery comprising in combination:

a first electrode comprising a dispersion of a chalcogenide in a hydrophobic, hydrocarbon elastomer binder absent unsaturation;

a second electrode including a Group Ia metal intercalatable with said chalcogenide;

a porous separator disposed between said electrodes comprising a hydrophobic elastomer substrate having a surface film of a poly-alkenyl imidazoline of the formula:



where R is slected from H, alkyl of 1 to 5 carbon atoms or phenyl;

an electrolyte comprising a sulfolane solvent in which is dissolved in an ionizable metal salt; and

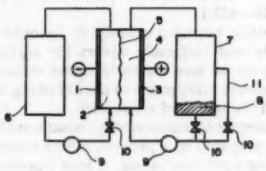
a casing receiving said electrodes and separator.

4,550,065

ELECTROLYTE CIRCULATION TYPE METAL-HALOGEN SECONDARY BATTERY

Toshinobu Fujii, Hino, and Akira Kokado, Tokyo, both of Japan, assignors to Meidensha Electric Mfg. Co., Ltd., Tokyo, Japan

Filed Apr. 12, 1982, Ser. No. 367,666
Int. Cl.[4] H01M *12/00*
U.S. Cl. 429—105 **10 Claims**



1. An electrolyte circulation type metal-halogen secondary battery, comprising:

a cell chamber which is divided into a cathode chamber and an anode chamber by a separator;

a cathode electrolyte storage tank in fluid communication with said cathode chamber by means of a circulation means;

an anode electrolyte storage tank in fluid communication with said anode chamber by means of a circulation means; and

an anode electrolyte contained in the anode chamber, said electrolyte comprising an aqueous solution of a metal bromide, a bromine complexing agent comprised of a tertiary amine having at least one alkyl group, and an inorganic acid.

4,550,066

SOLID ELECTROLYTE

M. Grayson Alexander, Windsor, and Brian Riley, Willimantic, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Nov. 1, 1984, Ser. No. 667,211
Int. Cl.[4] H01M *6/18*
U.S. Cl. 429—191 **4 Claims**

1. A solid electrolyte for power cells comprising a solid solution of from about 70 mole percent to about 90 mole percent of copper iodide and from about 30 mole percent to about 10 mole percent, respectively, of zinc iodide.

4,550,067

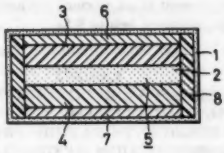
SECONDARY BATTERY

Tatsuo Horiba, Hitachi; Kazunori Fujita; Shinpei Matsuda, both of Toukai, and Kohki Tamura, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 458,054, Jan. 14, 1983, abandoned. This application Jun. 20, 1984, Ser. No. 622,624
Claims priority, application Japan, Jan. 14, 1982, 57-4510
Int. Cl.[4] H01M *10/00, 4/60*
U.S. Cl. 429—213 **14 Claims**

1. A secondary battery comprising an anode, a cathode, and a liquidous electrolyte layer interposed between the anode and the cathode, said electrolyte containing a dopant consisting of anions and cations, wherein said anode inlcudes an anode active material of an organic polymer which is capable of being reversively converted into a highly conductive sub-

stance by doping cations thereinto, said cathode includes a cathode active material capable of forming an intercalation compound with the cations in said electrolyte and in said anode and selected from the group consisting of metal phthalocya-



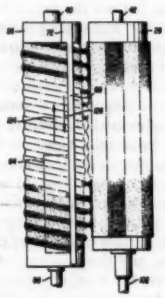
nine complexes, metal porphyrin complexes, and transition metal chalocogenide compounds, and the anions in said electrolyte are non-oxyacidic polyatomic anions to thereby reduce degradation of the organic polymer by oxidation.

4,550,068

VERTICAL MAGNETIC BRUSH DEVELOPING APPARATUS AND METHOD

Jeffrey B. Brooks, and Warren M. Larson, both of Keene, N.H., assignors to Markem Corporation, Keene, N.H.

Filed Jan. 30, 1984, Ser. No. 574,856
Int. Cl.[4] G03G *15/09*
U.S. Cl. 430—122 **14 Claims**



1. A vertically positioned magnetic brush developing apparatus for applying magnetically attractable developer particles to a latent electrostatic or magnetic image on a vertically presented recording surface, said apparatus comprising:

(a) a hopper for containing a supply of developer particles and having an outlet;

(b) a first magnetic roll assembly, serving as a supply roll, having its axis aligned in a substantially vertical direction and having its lower portion in communication with the hopper outlet for receiving developer particles therefrom, said supply roll comprising an inner magnetic element having a helical magnetic pole pattern and an outer non-magnetic shell surrounding said inner magnetic element for carrying the developer particles, at least one of said inner magnetic element and said outer shell being rotatable relative to the other about the axis of the supply roll for causing developer particles to move both circumferentially around the supply roll and upwardly along the vertical length of the supply roll, to thereby form a substantially continuous layer of developer particles on the outside surface of the supply roll;

(c) a supply roll doctor blade positioned adjacent to the outer shell of the supply roll and forming a narrow gap therewith in order to maintain on the supply roll shell a regulated layer of developer particles having a predetermined maximum thickness;

(d) a second rotatable magnetic roll assembly, serving as a developer roll, arranged in side-by-side relationship with the supply roll with a narrow vertical gap therebetween and having its axis aligned with the axis of the supply roll, said developer roll comprising an inner magnetic element having a magnetic pole pattern in which the magnetic poles are arranged in straight linear bands parallel to the roll axis and an outer non-magnetic shell surrounding said inner magnetic element for carrying the developer particles, at least one of said inner magnetic element and said outer shell being rotatable relative to the other about the axis of the developer roll for causing developer particles to move circumferentially around the developer roll, said developer roll being positioned sufficiently close to the supply roll and having a magnetic field strength sufficiently greater than that of the supply roll to cause developer particles on the outer shell of the supply roll to transfer to the outer shell of the developer roll, with the magnetic pole pattern of the developer roll thereupon causing the developer particles to move circumferentially around the developer roll in a substantially continuous layer; and

(e) a developer roll doctor blade positioned adjacent to the outer shell of the developer roll and forming a narrow gap therewith in order to maintain on the developer roll shell a regulated layer of developer particles having a predetermined maximum thickness.

4,550,069

POSITIVE PHOTORESIST COMPOSITIONS WITH O-QUINONE DIAZIDE, NOVOLAK, AND PROPYLENE GLYCOL ALKYL ETHER ACETATE

Thomas R. Pampalone, Mendham, N.J., assignor to American Hoechst Corporation, Somerville, N.J.

Filed Jun. 11, 1984, Ser. No. 619,468
Int. Cl.[4] G03C *1/60, 1/76;* G03F *7/26*
U.S. Cl. 430—165 **11 Claims**

1. A photosensitive positive working composition suitable for use as a photoresist, which consists essentially of, in admixture at least one novolak resin, at least one o-quinone diazide photosensitizer and a sufficient amount of a propylene glycol alkyl ether acetate to increase the effective photospeed of the composition.

10. A photosensitive element which comprises a substrate and the composition of claim 1 disposed on said substrate.

11. The element of claim 10 wherein said substrate comprises one or more components selected from the group consisting of silicon, aluminum, polymeric resins, silicon dioxide, doped silicon dioxide, silicon nitride, tantalum, copper, polysilicon, ceramics and aluminum/copper mixtures.

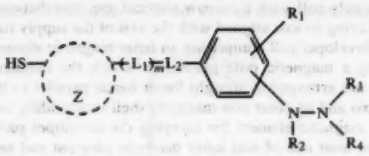
4,550,070

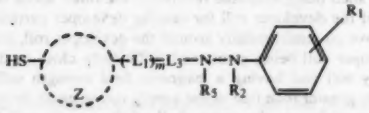
DIRECT POSITIVE SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

Tsutomu Miyasaka; Hidetoshi Kobayashi; Isamu Itoh, and Shigeo Hirano, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

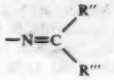
Filed Apr. 27, 1984, Ser. No. 604,554
Claims priority, application Japan, Apr. 28, 1983, 58-75400
Int. Cl.[4] G03C *5/24*
U.S. Cl. 430—202 **9 Claims**

1. A direct-positive silver halide photographic light-sensitive material comprising a support having thereon at least one imer latent image light-sensitive silver halide photographic emulsion layer, and containing in said photographic emulsion layer or at least one of other hydrophilic colloid layers a mercapto compound represented by the following general formula (I) or (II) as a nucleating agent:

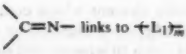

(I)


(II)

wherein Z represents an atomic group necessary to form a mononuclear or condensed nitrogen-containing heterocyclic ring, L_1 represents a divalent organic group, m represents 0 or 1, L_2 represents —CONR—, —NRCO—, —SO_2NR—, —NR-SO_2—, —OCO—, —COO—, —S—, —NR—, —CO—, —SO—, —SO_2—, —OCOO—, —NRCONR'—, —NR-COO—, —OCONR— or —NRSO_2NR'—, wherein R and R' each represents a hydrogen atom, an alkyl group or an aryl group, L_3 represents —CO—, —SO— or —SO_2—, R_1 represents a hydrogen atom, an alkyl group, a halogen atom, an alkoxy group, a carbonamide group or a sulfonamide group, R_2 represents a hydrogen atom or an alkoxycarbonyl group, R_3 represents an acyl group, an alkylsulfonyl group, an arylsulfonyl group, an alkylsulfinyl group, an arylsulfinyl group, an alkoxycarbonyl group, an aryloxycarbonyl group, a carbamoyl group, a sulfamoyl group or a sulfinamoyl group, R_4 represents a hydrogen atom, and R_3 may form the partial structure:



of hydrazone together with R_4 and a nitrogen atom, and R_5 represents a hydrogen atom or forms the partial structure: —C=N— of hydrazone together with L_3 and a nitrogen atom, wherein one of two bonds of the carbon atom in



and the other of two bonds of the carbon atom links to R'', R'' represents an alkyl group, an aryl group or a heterocyclic group, and R''' represents a hydrogen atom, an alkyl group, an aryl group or a heterocyclic group.

4,550,071

HEAT DEVELOPMENT USING ACIDS

Toshiaki Aono, and Koichi Nakamura, both of Kanagawa, Japan, assignors to Fuji Photo Film. Co., Ltd., Kanagawa, Japan

Filed Apr. 9, 1984, Ser. No. 597,970

Claims priority, application Japan, Apr. 9, 1983, 58-62569

Int. Cl.[4] G03C *5/54, 1/40*

U.S. Cl. 430—203 **13 Claims**

1. A method of forming an image comprising (A) imagewise exposing a light-sensitive material having on a support at least (1) a light-sensitive silver halide, (2) a binder, and (3) a compound which is chemically involved in the reduction of the light-sensitive silver halide to silver under high temperature thereby causing the production or the release of a mobile dye, (B) heating the light-sensitive material in a substantially water-free condition to form the mobile dye with an imagewise distribution subsequently to or simultaneously with the imagewise exposure and then, (C) transferring the mobile dye formed into a dye-fixing layer under high temperature and fixing it thereto; wherein an acidic component participates chemically in the reaction system for forming said mobile dye after the conclusion of the mobile dye-forming reaction, wherein said high temperature is not less than 80° C. and wherein said acidic component is present in an amount sufficient to adjust the pH value to in the range of below 8.5.

4,550,072

PHOTOSENSITIVE RECORDING MATERIALS CONTAINING PARTICLES FOR THE PRODUCTION OF ABRASION-RESISTANT GRAVURE PRINTING PLATES, AND THE PRODUCTION OF GRAVURE PRINTING PLATES USING THESE RECORDING MATERIALS

John Lynch, Monsheim, and Albert Elzer, Otterstadt, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 513,831, Jul. 14, 1983, abandoned, which is a division of Ser. No. 400,136, Jul. 20, 1982, abandoned. This application Oct. 2, 1984, Ser. No. 656,427

Int. Cl.[4] G03C *1/68, 1/71;* **G03F** *7/10*

U.S. Cl. 430—256 **11 Claims**

1. A process for the production of a gravure printing plate, which comprises exposing a photopolymerizable and/or photocrosslinkable layer (L), which is applied to a dimensionally stable base and consists of a photosensitive recording material, to actinic light through a halftone or line positive or through a continuous tone positive and a screen grid, washing out the non-exposed areas of the layer by means of a developer in which these areas, but not the exposed areas, of this layer are soluble or dispersible, and drying the resulting gravure printing plate, wherein the photopolymerizable and/or photocrosslinkable layer (L) contains, at least in a surface zone having a thickness of from 1 to 50 μm, measured from the surface of the layer (L), which subsequently constitutes the surface of the printing plate, finely-divided, abrasive particles in an amount of from 2 to 50% by weight, based on the photopolymerizable and/or photocrosslinkable layer (L) containing these particles, the mean particle size being from 0.1 to 6 μm, not more than 5% of these particles have a maximum particle size greater than 10 μm, the particles have a hardness of >4.0 on Mohs' hardness scale, the surface of the layer (L) has a peak-to-valley height of <2 μm, and the components of the layer (L) are chosen so that this layer, after exposure, development and drying, has a Vickers hardness, measured under load, of not less than 10 N/mm^2, at least to the thickness of the wells which take up the ink.

6. A process as claimed in claim 1, wherein the photopolymerizable and/or photocrosslinkable layer (L) is first applied to a polyester film as a temporary base, the layer is laminated, before or after exposure, onto the actual printing plate base, and the polyester film is then peeled off, this last step being carried out before washout with the developer.

4,550,073

OVERCOATED PHOTOHARDENABLE ELEMENT HAVING SURFACE PROTUBERANCES

Melvin A. Neiss, Annandale, and Robert W. Woodruff, East Brunswick, both of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 370,993, Apr. 22, 1982, abandoned. This application May 16, 1984, Ser. No. 610,843

Int. Cl.[4] G03C *1/68*

U.S. Cl. 430—273 **8 Claims**

1. A photohardenable element comprising a support bearing, in order, one photohardenable layer having a maximum thickness of 8 μm said photohardenable layer comprising (a) 10 to 30%, by weight of an ethylenically unsaturated compound capable of forming a high polymer by free radical initiated, chain propogating, addition polymerization or benzophenone type groups, (b) 10 to 60% by weight of an organic polymeric binder, and (c) 0.1 to 20% by weight of a free radical generat-

ing addition polymerization initiator system activatable by actinic radiation; and an outer polymeric nonphotosensitive liquid removable layer which is at least partially soluble in or permeable to the solvent for the photohardenable layer, the photohardenable layer being pigmented or dyed and having an optical density of at least 3.0 over at least the spectral range of 300 to 550 nm and having therein 5% to 50% by weight based on the weight of said photohardenable layer of substantially discrete, inert polymeric particles at least some of which protrude into and remain within the outer nonphotosensitive layer to cause protuberances in the outer nonphotosensitive layer, the size of the particles being within the range of 0.1 to 10.0 μm, not more than 50% of the particles being below 3.5 μm and having a specific gravity substantially equivalent to that of the surrounding photohardenable layer in which they are present.

4,550,074

SENSITIZING BATH FOR CHALCOGENIDE RESISTS

Costas H. Tzinis, Bridgewater, and Richard G. Vadimsky, Somerville, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 492,434, May 6, 1983, abandoned. This application Feb. 5, 1985, Ser. No. 699,481

Int. Cl.⁴ G03C *5/24*

U.S. Cl. 430—322 **23 Claims**

1. A method for fabricating a device, comprising the steps of:

forming a layer which includes a silver composition on a substrate-supported glass layer containing a chalcogenide element by immersing said glass layer in an aqueous sensitizing bath which includes a silver complex,

exposing selected portions of said glass layer to energy,

removing the residue of said silver composition-containing layer remaining on said glass layer, and

treating said glass layer with a developing agent to delineate a pattern within the glass, Characterized In That

said silver complex includes a ligand bound to a silver ion, the ligand including first and second moieties, the first moiety being hydrophobic and the second moiety being hydrophilic, both said ligand and said silver complex being soluble in said bath, and

said bath has a pH ranging from about 9 to about 13.

4,550,075

METHOD FOR LIGAND DETERMINATION UTILIZING AN IMMUNOASSAY MONITORABLE BY BIOTIN-CONTAINING ENZYMES, AND COMPOSITIONS THEREFOR

Cathy A. Bacquet, and Daniel Y. Twumasi, both of Austin, Tex., assignors to Kallestad Laboratories, Inc., Austin, Tex.

Filed Jun. 22, 1983, Ser. No. 506,889

Int. Cl.⁴ G01N *33/54;* **C12Q** *1/00;* **C12N** *9/96*

U.S. Cl. 435—7 **26 Claims**

1. A method for quantitating a first ligand in fluid medium suspected of containing said first ligand comprising intermixing with said fluid medium a biotin-containing enzyme, a labeled conjugate comprising avidin coupled to a second ligand said second ligand comprising a substance identical to said first ligand or an analog of said first ligand, appropriate substrate and cofactors for said biotin-containing enzyme, and a ligand-specific binding component, the activity of said enzyme capable of being modulated by said labeled conjugate, said labeled conjugate having the characteristics that when bound by said ligand-specific binding component it is unable to modulate said enzyme; and thereafter determining the amount of said first ligand in said fluid medium by measuring the change in activity of said enzyme.

4,550,076

RAPID ASSAYING METHOD FOR GUANASE

Nobumoto Chikazawa, Nara; Toshiharu Muraoka, Nagaokakyo, and Setsuro Fujii, Toyonaka, all of Japan, assignors to Maruho Co., Ltd., Osaka, Japan

Filed Sep. 27, 1982, Ser. No. 424,182

Claims priority, application Japan, Sep. 25, 1981, 56-152807

Int. Cl.⁴ C12Q *1/34, 1/26, 1/28*

U.S. Cl. 435—18 **6 Claims**

1. In the method of assaying guanase in the sample of the body fluid by adding guanine to said sample whereby said guanine is changed to xanthine, decomposing said xanthine to uric acid by xanthine oxidase whereby hydrogen peroxide is by-produced, reacting said hydrogen peroxide with 3-methyl-2-benzothiazolinonehydrazone and an aniline derivative in the presence of peroxidase whereby an indamine dye is produced, and finally measuring the optical absorption by said dye at 570–600 nm, the improvement for rapidly assaying the guanase comprising

(a) the reactions (I), (II), and (III) being separately and sequentially carried out;

(I) the xanthine-formation reaction,

(II) the hydrogen peroxide-formation reaction and

(III) the dye-producing reaction,

(b) the xanthine-formation-reaction being carried out within a pH in the range of 7–9, and (c) the hydrogen peroxide-formation reaction being carried out in the presence of a catalase inhibitor.

4,550,077

β-AMYLASE DETERMINATION

J. Eliot Woodbridge, Princeton, N.J.; George F. Bulbenko, Langhorne, Pa., and J. John Marshall, Miami, Fla., assignors to Electro-Nucleonics, Inc., Fairfield, N.J.

Filed May 7, 1980, Ser. No. 147,473

Int. Cl.⁴ C12Q *1/40, 1/32, 1/28;* **C12P** *19/14*

U.S. Cl. 435—22 **19 Claims**

1. A reagent kit for the determination of alphaamylase, comprising:

a. a water soluble carboxymethylated starch which is cleaved by alpha-amylase and which is not acted on by an exo-acting amylase, said water soluble carboxymethylated starch being present in an amount effective to determine alpha-amylase by measuring rate of glucose released after cleavage by alpha-amylase and enzymatic release of glucose by an exo-acting amylase;

b. an (enzyme or) enzyme mixture including an exo-acting amylase which is free of alpha-amylase and which is capable of and is present in an amount effective for releasing glucose from alpha-amylase cleaved carboxymethylated starch to determine alpha-amylase by measuring the rate of glucose production, said enzyme mixture containing β-amylase and a maltase which is free of alpha-amylase;

c. a buffer for maintaining pH for alpha-amylase determination, said buffer being free of enzyme inhibitor which would interfere with enzymatic activity for releasing glucose; and

d. enzymatic reagent for detecting rate of glucose formation, said enzymatic reagent being present in an amount effective for determining alpha-amylase by measuring the rate of glucose production, wherein said components (a), (b), (c) and (d) are present in an amount effective for a rate determination of alpha-amylase.

5. A reagent kit for the determination of α-amylase, comprising:

a. a water soluble carboxymethylated starch which is cleaved by α-amylase and which is not acted on by an exo-acting amylase, said water soluble carboxymethylated starch having a ratio of carboxymethylated glucose to glucose of from 1:4 to 1:16 and being present in an amount effective to determine α-amylase by measuring rate of glucose released after cleavage by α-amylase and enzymatic release of glucose by an exo-acting amylase;

b. an enzyme or enzyme mixture including an exo-acting amylase which is free of α-amylase and which is capable of and is present in an amount effective for releasing glucose from α-amylase cleaved carboxymethylated starch to determine α-amylase by measuring the rate of glucose production;

c. a buffer for maintaing pH for α-amylase determination, said buffer being free of enzyme inhibitor which would interfere with enzymatic activity for releasing glucose; and

d. enzymatic reagent for detecting rate of glucose formation, said enzymatic reagent being present in an amount effective for determining α-amylase by measuring the rate of glucose production, wherein said components (a), (b), (c) and (d) are present in an amount effective for a rate determination of α-amylase.

16. An assay for the determination of α-amylase, comprising: mixing a sample containing α-amylase and the reagent kit containing:

a. A water soluble carboxymethylated starch which is cleaved by alpha-amylase and which is not acted on by an exacting amylase, said water soluble carboxymethylated starch being present in an amount effective to determine alpha-amylase by measuring rate of glucose by an oxo-acting amylase;

b. An (enzyme or) enzyme mixture including an exacting amylase which is to free of alpha-amylase and which is capable of and is present in an amount effective for releasing glucose form alpha-amylase cleaved carboxymethylated starch to determine alpha-amylase by measuring the rate of glucose production, said enzyme mixture containing α-amylase and a maltase which is free of alpha-amylase:

c. A buffer for maintaining pH for alpha-amylase determination, said buffer being free of enzyme inhibitor which would interfere with enzymatic activity for releasing glucose; and

d. Enzymatic reagent of detecting rate of glucose formation, said enzymatic reagent begin present in an amount effective for determining alpha-amylase by measuring the rate of gluycose production, wherein said components (a), (b), (c) and (d) are present in an amount effective for a rate determination of alpha-amylase, incubating the mixture, to unblock the starch by action of α-amylase, release glucose by the action of said enzyme or enzyme mixture and indicate glucose production by the enzymatic reagent; and measuring the rate of glucose production to determine α-amylase in the sample.

4,550,078
METHOD FOR THE QUANTITATIVE DETERMINATION OF INDIVIDUAL POLYAMINE COMPONENTS IN A MIXTURE

Hideaki Yamada, Kyoto; Shogo Otsuji, Kagoshima; Kimiyasu Isobe, Konan; Kuniyoshi Matsunaga, Ichinomiya, and Tadahiko Inukai, Nagoya, all of Japan, assignors to Amano Seiyaku Kabushiki Kaisha, Aichi, Japan

Filed May 18, 1983, Ser. No. 495,677
Claims priority, application Japan, Sep. 14, 1982, 57-158848
Int. Cl.⁴ C12Q *1/26*
U.S. Cl. 435—25 **10 Claims**

1. A method for the quantitative determination of the individual contents of polyamine components in an aqueous mixture containing at least one of the polyamines selected from the group consisting of free polyamines including spermine, spermidine and putrescine and acetylated polyamines including acetylspermine, N^1- and N^8-acetylspermidines and acetylputrescine, of which at least one is one of the said acetylated polyamines, which comprises the steps of:

(a) subjecting the aqueous mixture to at least two steps of enzymatic oxidative decomposition reactions successively or separately, the number of the reaction steps being the same as or larger than the number of the polyamine components in the aqueous mixture, each by use of an oxidation enzyme selected from the group consisting of polyamine oxidases, putrescine oxidase and acetylputrescine oxidase, the kind of the enzyme or the conditions of the reaction being effective for the enzymatic oxidative decomposition of one or several of the polyamines but ineffective for the other polyamine components, to form hydrogen peroxide as a byproduct of the enzymatic oxidative decomposition reaction,

(b) determining the amount of the hydrogen peroxide formed in each of the steps of the enzymatic oxidative decomposition reactions,

(c) setting up a set of simultaneous equations each giving the amount of the hydrogen peroxide formed in each of the reaction steps as a function of the contents of the individual polyamine components in the aqueous mixture, and

(d) solving the simultaneous equations in terms of the respective contents of the individual polyamine components in the aqueous mixture.

4,550,079
DETERMINATION OF L(+)-TARTRATE OR D(+)-MALATE WITH L(+)-TARTRATE DEHYDROGENASE

Albert Röder, Seeshaupt; Hans Seidel, Tutzing, and Friedrich Giffhorn, Göttingen, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Mar. 4, 1983, Ser. No. 472,313
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1982, 3210583
Int. Cl.⁴ C12Q *1/32*; C12N *9/02, 9/04*
U.S. Cl. 435—189 **12 Claims**

1. Process for the determination of L(+)-tartrate in solution, comprising

(a) adding to said solution NAD and Mn^{2+} ions, and L(+)-tartrate dehydrogenase, said L(+)-tartrate dehydrogenase having L(+)-tartrate dehydrogenase and D(+)-malate dehydrogenase activities;

(b) measuring the NADH resulting from step (a); and

(c) relating the measurement of step (b) to the amount of L(+)-tartrate originally present in the solution.

9. A process for the determination of D(+)-malate in solution, comprising

(a) adding to said solution NADH and Mn^{2+} ions, and L(+)-tartrate dehydrogenase, said L(+)-tartrate dehydrogenase having L(+)-tartrate dehydrogenase and D(+)-malate dehydrogenase (decarboxylating) activities,

(b) measuring the NADH resulting from step (a); and

(c) relating the measurement of step (b) to the amount of D(+)-malate originally present in the solution.

4,550,080
PROCESS FOR THE PREPARATION OF A PLASMINOGEN ACTIVATOR

Akio Hasegawa, Numazu, and Hiroshige Kojima, Fuji, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 5, 1984, Ser. No. 617,452
Int. Cl.⁴ C12N *9/48*
U.S. Cl. 435—212 **6 Claims**

1. A process for the preparation of a plasminogen activator, which comprises bringing normal diploid cells derived from human bodies capable of producing the plasminogen activator into contact with a solution containing an enzymatically-decomposed animal meat peptone, the plasminogen activator having the following properties:

(a) molecular weight: 63,000±10,000;

(b) isoelectric point: 7.0 to 8.5;

(c) affinity to fibrin: present;

(d) affinity to Concanavalin A: present;

(e) optimum pH: 7 to 9.5; and

(f) no reactivity with anti-urokinase specific antibody.

4,550,081

NON-REVERTING SALMONELLA

Bruce A. D. Stocker, Portola Valley, Calif., assignor to The Board of Trustees of The Leland Stanford Jr. University, Stanford, Calif.

Continuation-in-part of Ser. No. 151,002, May 19, 1980, abandoned. This application Sep. 7, 1982, Ser. No. 415,291

Int. Cl.[4] C12N *1/20;* C12R *1/42*

U.S. Cl. 435—253 2 Claims

1. *Salmonella typhimurium* strain SL1479, ATCC No. 39183.

2. *Salmonella dublin* strain SL1438, ATCC No. 39184.

4,550,082

PROCESS FOR THE DETECTION AND THE QUALITATIVE AND QUANTITATIVE DIFFERENTIATION OF NATURALLY DEUTERATED MOLECULES AND APPLICATION THEREOF MORE ESPECIALLY TO THE DETECTION OF CHAPTALIZATION OF WINES

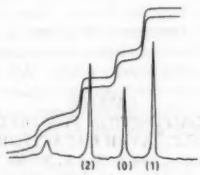
Gérard J. Martin, and Maryvonne L. Martin, both of Nantes, France, assignors to Centre National de la Recherche Scientifique, Paris, France

Filed Dec. 1, 1982, Ser. No. 446,049

Claims priority, application France, Dec. 4, 1981, 81 22710

Int. Cl.[4] G01N *24/00, 33/14*

U.S. Cl. 436—24 16 Claims



1. A process for the detection and quantitative and qualitative differentiation of naturally deuterated products and for detecting chaptalization of wines, comprising:

(a) preparing a standard by mixing a portion of a hydrocarbon-containing compound with another portion of the same compound which has been artificially deuterated to 95–99% to obtain an overall deuteration rate of the mixture of between 0.01 and 0.2%;

(b) introducing the standard into a measuring cell of a nuclear magnetic resonance analysis apparatus (NMR); said measuring cell capable of receiving the standard and the products to be analyzed without the occurrence of any mixing thereof;

(c) adding the product to be analyzed to the measuring cell; and

(d) introducing the measuring cell into the NMR apparatus and recording a deuterium spectrum thereof which is then compared with a NMR deuterium spectrum of products of known geographical origin and known chemical and/or biochemical sources, previously prepared with the same standard.

4,550,083

KARL-FISCHER REAGENT AND PROCEDURE FOR THE DETERMINATION OF WATER USING IT

Wolfgang Fischer; Georg Seitz, both of Darmstadt, and Karl-Dieter Krenn, Pfungstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Feb. 14, 1983, Ser. No. 466,187

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1982, 3204962

Int. Cl.[4] G01N *33/18*

U.S. Cl. 436—42 17 Claims

1. A Karl-Fischer reagent useful in the determination of water comprising a Karl-Fischer solvent, sulfur dioxide, iodine, and a salt which is a Karl-Fischer reagent compatible addition compound of a nitrogen-containing organic base having a $pK_b < 10$ with a weak aromatic carboxylic acid having a $pK_a > 2$.

4,550,084

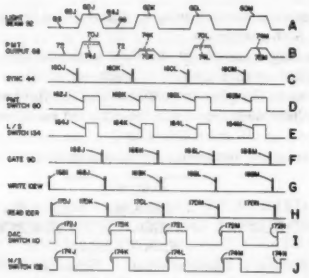
ANALYSIS SYSTEM

Larry A. Nelson, and Leon W. Schmidt, both of Spokane, Wash., assignors to Allied Corporation, Morristown, N.J.

Division of Ser. No. 339,331, Jan. 15, 1982, Pat. No. 4,446,106. This application Nov. 18, 1983, Ser. No. 553,096

Int. Cl.[4] G01N *9/30, 35/00*

U.S. Cl. 436—45 9 Claims



1. A process for concurrently monitoring the progress of a plurality of time varying chemical reactions which comprises

providing analytical region sensor means that generates an analysis signal proportional to a sensed analytical region condition,

positioning a plurality of analysis regions adjacent said sensor means,

causing said sensor means to sequentially and repetitively produce analysis signals having values proportional to a characteristic of the chemical reactions in said analysis regions,

transmitting said analysis signals from said sensor means through a signal transmission channel to memory means for storage at a location corresponding to that analytical region during each analytical region sensing interval,

during a first portion of a subsequent analytical region sensing interval, placing said transmission channel in a fast response mode and presetting said transmission channel to the data signal value stored in the memory location corresponding to that analytical region,

during a second portion of said subsequent analytical region sensing interval, placing said transmission channel in a slower response mode, and applying the analysis signal generated by said sensor means in response to sensing of the chemical reaction in that analytical region to said signal transmission channel to adjust said preset data signal value to correspond to the data signal value currently represented by said analysis signal from said sensor means, and

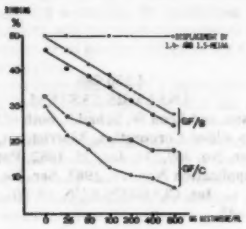
storing the adjusted data signal value in said memory means at a location corresponding to that analytical region.

4,550,085

METHOD OF DETECTING OR DETERMINING HISTAMINE IN HISTAMINE CONTAINING MATERIALS

Per S. Skov, Kanslergade 6 st., 2100 Copenhagen O; Svend Norn, Skovvang 1, 3460 Birkerod, and Bent Weeke, Tollosevej 20, 2700 Bronshoj, all of Denmark

Filed Sep. 8, 1981, Ser. No. 300,262
Claims priority, application Denmark, Jul. 6, 1981, 2982/81
Int. Cl.⁴ G01N *33/48, 33/58*
U.S. Cl. 436—98 **6 Claims**



1. A method for detecting or determining histamine in body fluids which comprises:

contacting a sample of the fluid with glass microfibers deposited onto a carrier in such quantitative proportions between the glass microfibers and the fluid as will permit the histamine amount to be detected or determined to be bound to the microfibers; and

registering or measuring the bound amount of histamine.

4,550,086

MONOCLONAL ANTIBODIES THAT RECOGNIZE HUMAN T CELLS

Ellis L. Reinherz, Lincoln; Stuart F. Schlossman, Newton Centre, both of Mass., and Stefan C. Meuer, Alzey, Fed. Rep. of Germany, assignors to Dana-Farber Cancer Institute, Inc., Boston, Mass.

Filed Feb. 16, 1983, Ser. No. 466,948
Int. Cl.⁴ G01N *33/50, 33/58*
U.S. Cl. 436—506 **13 Claims**

1. A mammalian monoclonal antibody which specifically binds to the surface recognition structure of a mature human T lymphocyte clone, said T lymphocyte clone deleteriously recognizing a specific target epitope and thereby acting as a causative agent in an autoimmune disease, said surface recognition structure comprising a glycoprotein heterodimer responsible for said clone's ability to recognize said epitope, said monoclonal antibody being capable of specifically binding to said recognition structure of said clone and thereby inhibiting the ability of said clone to act as a causative agent in said autoimmune disease.

4,550,087

PHOTOCHROMIC COMFORT GLASSES

David J. Kerko; David W. Morgan, both of Corning, and Richard W. Thompson, Big Flats, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Sep. 13, 1984, Ser. No. 650,194
Int. Cl.⁴ C03C *3/26, 3/08*
U.S. Cl. 501—13 **3 Claims**

1. An essentially haze-free photochromic glass which, in a thickness of about 2 mm, will exhibit the following photochromic properties when measured by solar simulator:

(a) over the range of about 0°–40° C. will darken to a luminous transmittance in the presence of actinic radiation of between about 40–60%;

(b) over the range of about 0°–40° C. the difference in darkened luminous transmittance will be less than 15 percentage units of transmittance; and

(c) over the range of about 25°–40° C. will fade at least 30 percentage units of transmittance after five minutes' removal from the actinic radiation;

said glass having a composition suitable for refractive index adjustment and capable of being chemically strengthened without substantial loss of photochromic properties consisting essentially, expressed in terms of weight percent on the oxide basis, with the levels of Ag, Cu_2O, Cl, and Br representing values as analyzed in the glass, of:

Li_2O	0–2.5	P_2O_5	0–25
Na_2O	0–9	SiO_2	20–65
K_2O	0–17	Ag	0.115–0.145
Cs_2O	0–6	Br	0.11–0.155
$Li_2O + Na_2O + K_2O + Cs_2O$	8–20		
B_2O_3	14–23	Cu_2O	0.007–0.011
Al_2O_3	5–25	Cl	0.1–0.15

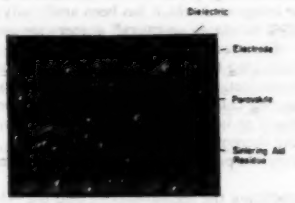
and wherein the molar ratio alkali metal oxide:B_2O_3 ranges between about 0.55–0.85, the weight ratio Ag:(Cl+Br) ranges between about 0.65–0.95, and the sum of Ag+Br is at least 0.26%, when the Br content is 0.11%, and at least 0.25% when the Ag content is 0.115%.

4,550,088

CERAMIC COMPOSITION FOR DIELECTRIC IN MULTILAYER CAPACITORS

Hyun D. Park, Taylors, and Arthur E. Brown, Mauldin, both of S.C., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 599,977, Apr. 19, 1984, abandoned. This application Mar. 19, 1985, Ser. No. 713,556
Int. Cl.⁴ C04B *35/00;* **H01B** *3/12*
U.S. Cl. 501—135 **3 Claims**



1. A lead oxide-base dielectric ceramic material having high dielectric constant and high insulation resistance which is capable of being formed from a mixture of oxide powders by sintering at temperatures in the range of 900° to 1050° C., said ceramic material consisting essentially of by weight,

2.49 to 6.67% Fe_2O_3

24.18 to 28.14% Nb_2O_5

2.09 to 3.59% MgO

0.025 to 0.10% MnO_2

0.20 to 1.50% in the aggregate of one or more of the following oxides: GeO_2, SiO_2, Bi_2O_3, CdO, ZnO, Al_2O_3, CuO and B_2O_3, chemically combined with at least 20% by weight of PbO, to form a sintering aid additive having a melting point of no more than 775° C. and a resistivity at 25° C. of at least 10^{13} ohm-cm, said dielectric composition having a total lead oxide content, as PbO, of from 64.32 to 66.20% and having an atomic ratio of Pb to the sum of Nb, Fe and Mg of from 0.893 to 0.913 and the weight ratio of MgO to FeO is from 0.34 to 1.3.

4,550,089

MICROWAVE DIELECTRIC CERAMIC COMPOSITIONS

Kazutoshi Ayusawa; Hosaku Satoh, and Munetada Kazama, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed May 3, 1984, Ser. No. 606,462
Claims priority, application Japan, May 9, 1983, 58-79432
Int. Cl.[4] C04B 35/46, 35/50
U.S. Cl. 501—139 1 Claim

1. A microwave dielectric ceramic composition consisting of 15–19 mol% of barium oxide (BaO), 61–73 mol% of titanium dioxide (TiO_2), 3.5–15 mol% of samarium oxide (Sm_2O_3), and 1.5–15 mol% of cerium oxide (CeO_2).

4,550,090

REGENERATION OF ZSM-5 TYPE CATALYST WITH A SOURCE OF ALKALI OR ALKALINE EARTH METAL CATIONS OR AMMONIA

Thomas F. Degnan, Yardley, Pa., and Malvina Farcasiu, Princeton, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 526,847, Aug. 26, 1983, abandoned.
This application Oct. 10, 1984, Ser. No. 659,505
Int. Cl.[4] B01J 29/38; C10G 47/16, 47/20, 11/05
U.S. Cl. 502—25 17 Claims

1. A method for regenerating a regenerable deactivated catalyst comprising a crystalline acidic zeolite, a carbonaceous residue, and tenaciously sorbed nitrogen compounds, said nitrogen compounds having been acquired from a petroleum or petrochemical hydrocarbon feed concomitant with catalytic conversion of said feed, which method comprises:

contacting said deactivated catalyst with a source of alkali metal or alkaline earth metal cations, ammonia, or mixtures thereof, whereby rendering said nitrogen compounds extractable;

extracting said extractable nitrogen compounds with a liquid organic solvent selected from the group consisting of alcohols, ethers, esters, nitrites, furans, tetrahydrofurans and paraffinic and aromatic hydrocarbons having up to eight carbon atoms, said contacting and extraction being conducted in the absence of said feed at about 20° C. to about 300° C. for about 1 hour to 100 hours;

and converting said extracted catalyst to the hydrogen form.

10. The method described in claim 1 wherein said crystalline acidic zeolite has a silica to alumina ratio greater than 12, a Constraint Index between 1 and 12, and wherein said catalytic conversion is catalytic dewaxing at a temperature below about 850° F.

14. The method described in claim 10 wherein said deactivated catalyst is contacted under substantially anhydrous conditions with a mixture of anhydrous ammonia and organic solvent.

4,550,091

NON-AQUEOUS EXCHANGE OF ACIDIC SITES ON MOLECULAR SIEVES

David L. Sikkenga, Wheaton, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jun. 25, 1984, Ser. No. 624,047
Int. Cl.[4] B01J 37/30, 31/32
U.S. Cl. 502—62 9 Claims

1. A process for non-aqueous exchange of acidic sites on catalysts comprising a support material having acidic sites and a molecular sieve wherein cracking activity of said catalyst is reduced and conversion and/or selectivity is increased in dehydroisomerization and isomerization reactions which process comprises contacting said catalyst with a metal cation-organic ligand complex dissolved in a non-aqueous solvent wherein said organic ligand solvates said metal cation whereby said metal cation exchanges with and deactivates acidic sites of the catalyst support material without deactivating all acidic sites of said molecular sieve at a temperature of 0°–150° C. and a pressure of 1–50 atmospheres.

2. The process of claim 1 wherein said support material is selected from the group consisting of alumina, silica gel, synthetic alumina-silicates and natural aluminosilicates and borosilicates.

7. The process of claim 1 wherein said organic ligand is selected from the group consisting of dioctyl sulfosuccinate and a crown ether.

4,550,092

ACTIVITY ENHANCEMENT OF HIGH SILICA ZEOLITES

Clarence D. Chang, Princeton, and Joseph N. Miale, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 317,037, Nov. 21, 1981, Pat. No. 4,435,516.
This application Nov. 25, 1983, Ser. No. 555,118
The portion of the term of this patent subsequent to Mar. 6, 2001, has been disclaimed.
Int. Cl.[4] B01J 29/28
U.S. Cl. 502—71 8 Claims

1. The product produced by contacting a high silica containing crystalline zeolite having a silica-to-alumina ratio greater than 500 with an ammoniacal solution of an alkali metal aluminate for a period of time ranging from ½ hour to 5 days at a temperature of from 20° to 50° C. and at pH of at least 10.

3. The product produced by contacting a high silica zeolite of the ZSM-5 type having a silica-to-alumina ratio of at least 500 with an ammoniacal solution of an alkali metal aluminate at a temperature of from 20° to 50° C. for a period of time ranging from ½ day to 5 days and at a pH of at least 10.

4,550,093

ALUMINA-BASED AEROGEL SUPPORTED TRANSITION METAL CATALYST USEFUL AS A ZIEGLER-NATTA OLEFIN POLYMERIZATION CATALYST AND PROCESS FOR PREPARING SAME

Anthony J. Fanelli, Rockaway, and Alson K. Price, Chester, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 422,928, Sep. 24, 1982, Pat. No. 4,478,987.
This application Aug. 6, 1984, Ser. No. 616,521
Int. Cl.[4] C08F 4/02, 4/62, 4/64, 4/68
U.S. Cl. 502—107 16 Claims

6. A method of preparing a catalyst system for polymerization and copolymerization of alpha-olefins which comprises:

(a) forming a solution or a suspension comprising an alcohol or mixture of alcohols selected from C_1 to C_5 alcohols and a hydrolyzable aluminum compound and at least about a stoichiometric amount of water required to hydrolyze said aluminum compound;

(b) heating a suspension comprising the hydrolyzed and hydrolyzable aluminum compound in the presence of a solvent comprising methanol to a temperature above the critical temperature of the solvent comprising methanol;

(c) removing the solvent comprising methanol under supercritical conditions to form an alumina-based aerogel having a carbon content;

(d) heating said carbon-containing alumina-based aerogel in the presence of an oxygen-containing gas stream at a temperature of at least about 400° C. for a time sufficient to form a heat activated alumina-based aerogel substantially free of carbon; and

(e) reacting said heat-activated aerogel under substantially anhydrous conditions with a transition metal compound formed from a member selected from the group consisting of titanium, vanadium, hafnium, and zirconium and members selected from the group consisting of chloride, oxychlorides, alkoxychlorides and oxyalkoxychlorides with said heat-activated aerogel to form a catalyst system having a BET surface area greater than about 300 m^2/g, a

pore volume greater than about 3 cm^3/g, a bulk density less than about 0.1 g/cm^3.

4,550,094

SOLID CATALYST COMPONENT FOR OLEFIN POLYMERIZATION

Katsumi Hanji, Funabashi, and Kiyoshi Kawai, Toyonaka, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Feb. 9, 1983, Ser. No. 465,306

Claims priority, application Japan, Feb. 16, 1982, 57-24075; Oct. 15, 1982, 57-181668

Int. Cl.⁴ C08F *4/62, 4/64, 4/68*

U.S. Cl. 502—110 **60 Claims**

34. A process for the preparation of a solid catalyst component for olefin polymerization, which comprises reacting

(A) a silicon compound selected from the group consisting of

(1) silicon compounds represented by the general formula $R^1_aR^2_bR^3_cSi$, wherein R^1, R^2 and R^3 are each an alkyl, cycloalkyl, aralkyl, aryl, alkoxy, aryloxy, or hydroxyl group or a halogen or hydrogen atom; and a, b and c are numbers defined by the formulas $0 \leqq a,b,c \leqq 4$ and $a+b+c=4$; and

(2) silicon compounds containing the linkage Si-O-Si and polymers thereof

with

(B) a compound of a transition metal of Groups IVa, Va and VIa of the periodic table to form a reaction mixture (I), further reacting the reaction mixture (I) with

(C) an organomagnesium compound selected from simple organomagnesium compounds and hydrocarbon-soluble complexes thereof with an organometallic compound capable of solubilizing said organomagnesium compounds to produce an intermediate product (II), and contacting the intermediate product (II) with

(D) a halogen-containing compound of a transition metal of Groups IVa, Va and VIa of the periodic table, to form a hydrocarbon-insoluble product (III) to be used as the solid catalyst component.

35. A process for the preparation of a solid catalyst component for olefin polymerization according to claim **34**, wherein the intermediate product (II) is reacted with

(E) an organoaluminum halide represented by the general formula $R^4_lAlX_{3-l}$, wherein R^4 is an organic group having 1 to 20 carbon atoms, X is a halogen atom, and l is a number defined by the formula $0<l<3$, and the resulting reaction product (IV) is contacted with

(D) a halogen-containing compound of a transition metal of Groups IVa, Va and VIa of the periodic table.

4,550,095

CATALYST COMPONENT FOR POLYMERIZATION OF OLEFINS

Masafumi Imai; Tadashi Yamamoto; Hiroyuki Furuhashi; Hiroshi Ueno, and Naomi Inaba, all of Saitama, Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 20, 1984, Ser. No. 642,457

Claims priority, application Japan, Aug. 30, 1983, 58-157091

Int. Cl.⁴ C08F *4/64*

U.S. Cl. 502—119 **20 Claims**

1. A catalyst component for the polymerization of olefins obtained by (1) reacting (A) Mg(OR)(OR') with (B) a silicon compound having at least one silicon-hydrogen bond (2) contacting the reaction product with (C) an electron donor compound (D), (3) contacting the resulting contact product two or more times with a titanium halide, and (4) between at least one of the multiple titanium halide contacts, contacting the titanium halide contacted solid with a halogenated hydrocarbon wherein R and R' are radicals selected from alkyl, alkenyl, cycloalkyl, aryl, and aralkyl radicals and R and R' may be the same or different.

4. The catalyst component of claim **1** wherein the titanium halide is titanium tetrachloride.

5. The catalyst component of claim **4** wherein R and R' are alkyl radicals having from 1 to 8 carbon atoms, the silicon compound is a hydrosilane, the electron donor is an alkyl ester of an aromatic carboxylic acid and the halogenated hydrocarbon is hexachloroethane.

6. The catalyst component of claim **5** wherein R and R' are ethyl.

7. The catalyst component of claim **6** wherein the hydrosilane is trichlorosilane.

4,550,096

HOMOGENEOUS CATALYTIC SYSTEM COMPRISING RHODIUM, HYDRAZINE AND PHOSPHINE AND A PROCESS FOR THE PREPARATION OF SAME

Philip R. Page, Parede, and Ivan Villax, Lisbon, both of Portugal, assignors to Plurichemie Anstalt, Liechtenstein

Filed Jan. 14, 1983, Ser. No. 458,068

Claims priority, application Portugal, Jan. 19, 1982, 74303; Dec. 30, 1982, 76061

Int. Cl.⁴ B01J *31/24, 31/18;* **C07C** *103/19*

U.S. Cl. 502—166 **17 Claims**

1. A process or the preparation of a new stable homogeneous hydrogenation catalyst of rhodium comprising the step of reacting rhodium trichloride or a rhodium complex with a tertiary phosphine of the formula $PR_1R_2R_3$, in which R_1 and R_2 are phenyl, substituted phenyl, or dimethylamino and R_3 is phenyl, substituted phenyl, alkyl, aralkyl, benzyl, or dimethylamino, in the presence or absence of an excess of the tertiary phosphine and in the case of the rhodium trichloride in the presence of an excess of the tertiary phosphine, and then reacting the resulting product with a molar excess with respect to the moles of rhodium of a hydrazine or salt thereof of the formula $R'_1R'_2N.NR'_3R'_4$, in which R'_1 is a lower alkyl, phenyl, benzenesulphonyl or hydrogen, and R'_2, R'_3 and R'_4 are lower alkyl or hydrogen, with the proviso that when R'_1 is phenyl or benzenesulphonyl, R'_2, R'_3 and R'_4 are hydrogen, in an inert organic solvent at a temperature between 0° C. and the reflux temperature of the medium, for up to five hours.

2. A process according to claim **1**, in which the complex of rhodium is reacted with the hydrazine or salt thereof and the catalyst is recovered by addition of a nonsolvent therefor which is miscible in the reaction mixture followed by filtration.

17. A stable homogeneous hydrogenation catalyst produced by the process of claim **1** whose infra-red spectrum has a broad peak at 6.3 microns and containing 10 to 18.32% rhodium.

4,550,097

CATALYST FOR THE PRODUCTION OF ALLYL ACETATE

Charles A. Drake, Nowata, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 20, 1984, Ser. No. 642,464

Int. Cl.⁴ B01J *21/08, 23/78, 23/84*

U.S. Cl. 502—170 **11 Claims**

1. A catalyst suitable for the acetoxylation of propylene consisting essentially of metals on a support said metals consisting essentially of potassium, bismuth, palladium, and a promoting amount of magnesium or a combination of magnesium and barium.

4,550,098

METHODS FOR THE REMOVAL OF GASEOUS IMPURITIES FROM MIXED GAS STREAMS

Theodore A. Gens, Lake Zurich, Ill., assignor to The BOC Group, Inc., Montvale, N.J.

Filed Nov. 12, 1982, Ser. No. 441,383

Int. Cl.⁴ B01J *21/04, 23/78;* **C01B** *17/04;* **B01D** *53/34*

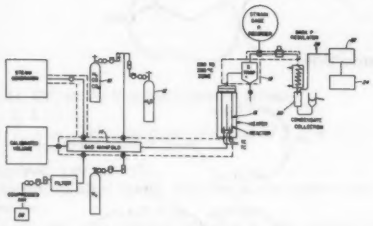
U.S. Cl. 502—324 **20 Claims**

2. A method for the preparation of the D-M-O reactive solid

containing alumina wherein D is potassium, M is manganese and O is oxygen, comprising the steps of:

(a) dissolving potassium permanganate in water,

(b) adding, to the potassium permanganate solution resulting from step (a), about 0.01 to about 0.20 mole of aluminum nitrate per mole of potassium permanganate in said solution,



(c) drying the solution resulting from step (b) to a solid,

(d) heating the resultant solid to temperatures between about 600° C. to about 900° C. under an inert atmosphere for about one-half hour,

(e) cooling the solid resulting from step (d) to about room temperature, and

(f) pressing the solid into cylindrical disks.

4,550,099

PEPTIDES WITH NERVE-REGENERATING PROPERTIES

Willem H. Gispen, Zeist, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

Continuation of Ser. No. 425,087, Sep. 21, 1982, abandoned. This application Oct. 9, 1984, Ser. No. 658,544

Claims priority, application Netherlands, Apr. 8, 1981, 8101724

Int. Cl.⁴ A61K *37/00*

U.S. Cl. 514—14 **4 Claims**

1. A method of treating patients suffering from a partly degenerated nerve system which comprises treating said patients with an effective amount of a peptide of the formula I

A—B—L—Phe(or L—Ala)—D—Lys—L—Phe—Z—OH, (I)

wherein

A represents one of the following groups: H—L—Met, H—L—Met(O), H—L—Met(O_2), desamino-Met, desamino-Met(O), or desamino-Met(O_2),

B represents one of the following di-peptide fragments: L—Glu—L—His, D—Glu—L—His, L—Glu—D—His, L—Ala—L—Ala, D—Ala—L—Ala or L—Ala—D—Ala,

and

Z represents a single bond, the amino acid residue Gly, or the peptide residue Gly—L—Lys—L—Pro—L—Val—Gly—L Lys—L—Lys

or

Gly—D—Lys—L—Pro—L—Val—Gly—L—Lys—L—Lys,

or a functional derivative selected from a C-terminal C_1–C_6 aliphatic ester, a C-terminal unsubstituted, monomethyl or dimethyl substituted amide, a pharmaceutically acceptable acid addition salt, or a metal complex thereof,

said amount being effective in stimulating or promoting axonal regeneration.

4,550,100

PROCESS FOR THE PREPARATION OF 17α-BROMOETHYNYL- AND 17α-IODOETHYNYL-17β-HYDROXY STEROIDS AND NOVEL PRODUCTS THEREOF

Helmut Hofmeister; Paul E. Schulze; Klaus Annen; Henry Laurent, and Rudolf Wiechert, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

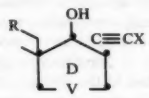
Filed Nov. 16, 1983, Ser. No. 552,537

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1982, 3242892

Int. Cl.⁴ C07J *1/00*; A61K *31/56*

U.S. Cl. 514—179 **26 Claims**

1. A process for preparing an unlabeled or radioactively labeled 17α-bromoethynyl- or 17α-iodoethynyl-17β-hydroxy androstane or estrane of the partial formula



wherein

is a single or double bond,

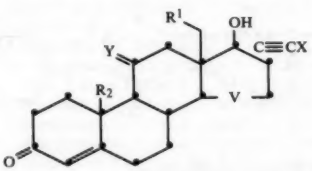
V is a carbon-carbon bond or a methylene group,

R is hydrogen or methyl, and

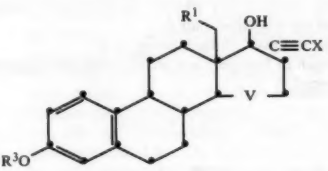
X is bromine or iodine,

comprising reacting a corresponding 17α-ethynyl-17β-hydroxy androstane or estrane in an inert solvent with at least a stoichiometric amount of brominating agent or an iodinating agent in the presence of a catalytically effective amount of silver cations.

14. A 17α-bromoethynyl- or 17α-iodoethynyl-17β-hydroxy steroid of Formulae I or II



(I)



(II)

wherein

is a single or double bond,

X is Br or I,

V is a C-C bond or a methylene group,

Y is a methylene group,

R^1 and R^2 each independently is hydrogen or methyl, and

R^3 is C_{1-4}-alkyl or, when

X is bromine, also hydrogen.

4,550,101

IRON COMPLEXES OF HYDROXY PYRIDONES USEFUL FOR TREATING IRON DEFICIENCY ANEMIA

Robert C. Hider, Clacton; George Kontoghiorghes; Jack Silver, both of London, and Michael A. Stockham, Saffron Walden, all of England, assignors to National Research Development Corporation, London, England

Filed Mar. 24, 1983, Ser. No. 478,494

Claims priority, application United Kingdom, Mar. 24, 1982, 8208608; Oct. 22, 1982, 8230148

Int. Cl.⁴ C07D *213/69;* A61K *31/555*

U.S. Cl. 514—188 **35 Claims**

1. A pharmaceutical composition comprising:

(a) a ferric complex of a 3-hydroxypyrid-2-one or 3-hydroxypyrid-4-one in which the hydrogen atom attached to the nitrogen atom is replaced by a C_1–C_6 aliphatic hydrocarbon group, wherein the ferric complex is a neutral complex containing a 3:1 molar proportion of pyridone: iron (III); and wherein one or more of the hydrogen atoms attached to ring carbon atoms may be replaced by a C_1–C_6 aliphatic hydrocarbon group,

(b) a physiologically acceptable diluent or carrier.

14. A compound being a neutral ferric complex containing 1 molar proportion of iron (III) and 3 molar proportions of a 3-hydroxypyrid-2-one or 3-hydroxypyrid-4-one in which the hydrogen atom attached to the nitrogen atom is replaced by a C_1–C_6 aliphatic hydrocarbon group wherein one or more of the hydrogen atoms attached to ring carbon atoms may also be replaced by a C_1–C_6 aliphatic hydrocarbon group.

4,550,102

CEPHEM COMPOUNDS

Tsutomu Teraji, Osaka; Kazuo Sakane, Amagasaki, and Jiro Goto, Suita, all of Japan, assignors to Fujisawa Pharmaceutical Co. Ltd., Osaka, Japan

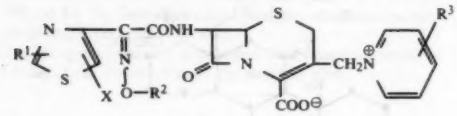
Filed Sep. 8, 1982, Ser. No. 415,910

Claims priority, application United Kingdom, Sep. 14, 1981, 8127664

Int. Cl.⁴ C07D *501/38;* A61K *31/545*

U.S. Cl. 514—206 **9 Claims**

1. A compound of the formula:



wherein

R^1 is amino or lower alkanoylamino,

R^2 is lower alkyl, lower alkynyl, carboxy(lower)alkyl or esterified carboxy(lower)alkyl,

R^3 is amino or lower alkanoylamino, and

X is hydrogen or halogen; and pharmaceutically acceptable salts thereof.

4,550,103

ANTIBACTERIAL 1-OXO-BENZOQUINOLIZINE-2-CARBOXYLIC ACIDS

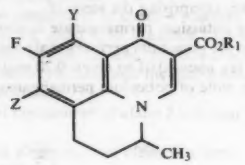
Thomas F. Mich, and Townley P. Culbertson, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jul. 20, 1984, Ser. No. 632,999

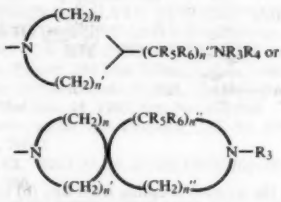
Int. Cl.⁴ A01N *43/42;* C07D *455/04*

U.S. Cl. 514—210 **10 Claims**

1. A compound of the formula



wherein Z is



Y is hydrogen or amino; n is 1, 2, 3, or 4;

n′ is 1, 2, 3, or 4 wherein n+n′ is a total of 2, 3, 4, or 5, and n″ is 1or 2;

R_1 is hydrogen, alkyl having from one to six carbon atoms or a cation;

R_3 is hydrogen, alkyl having from one to four carbon atoms or cycloalkyl having three to six carbon atoms;

R_4 is hydrogen, alkyl from one to four carbon atoms, hydroxyalkyl having two to four carbon atoms, trifluoroethyl, or R_7CO— wherein R_7 is alkyl having from one to four carbon atoms or alkoxy having from one to four carbon atoms;

R_5 is hydrogen or alkyl having from one to three carbon atoms;

R_6 is hydrogen or alkyl having from one to three carbon atoms; and the pharmaceutically acceptable acid addition or base salts thereof.

9. A pharmaceutical composition comprising an antibacterially effective amount of a compound as claimed in claim 1 together with a pharmaceutically acceptable carrier.

4,550,104

ANTIBACTERIAL THIAZOLO-QUINOLINES AND THIAZOLO-NAPHTHYRIDINES

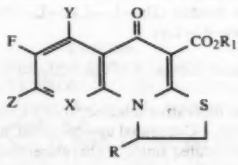
Thomas F. Mich, Ann Arbor, and Joseph P. Sanchez, Canton, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jul. 20, 1984, Ser. No. 632,911

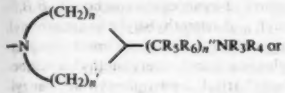
Int. Cl.⁴ A01N *43/90;* C07D *519/00, 513/04, 513/14*

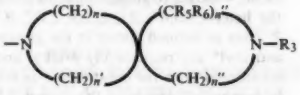
U.S. Cl. 514—210 **34 Claims**

1. A compound of the formula



wherein Z is





X is CH, CF, or N; Y is hydrogen or amino;
n is 1, 2, 3, or 4;
n′ is 1, 2, 3, or 4 wherein n+n′ is a total of 2, 3, 4, or 5, and n″ is 0, 1, or 2;
R is hydrogen or methyl;
R_1 is hydrogen, alkyl having from one to six carbon atoms or a cation;
R_3 is hydrogen, alkyl having from one to four carbon atoms or cycloalkyl having three to six carbon atoms;
R_4 is hydrogen, alkyl from one to four carbon atoms, hydroxyalkyl having two to four carbon atoms, trifluoroethyl, or R_7CO- wherein R_7 is alkyl having from one to four carbon atoms or alkoxy having from one to four carbon atoms;
R_5 and R_6 are each hydrogen or alkyl having from one to three carbon atoms, and the pharmaceutically acceptable acid addition or base salts thereof.

33. A pharmaceutical composition comprising an antibacterially effective amount of a compound as claimed in claim 1 together with a pharmaceutically acceptable carrier.

4,550,105

1-SULFO-2-OXOAZETIDINE DERIVATIVES AND THEIR PRODUCTION

Taisuke Matsuo, Ibaraki; Shoji Kishimoto, Takarazuka, and Michihiko Ochiai, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

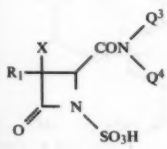
Filed Dec. 3, 1981, Ser. No. 326,937

Claims priority, application PCT Int'l Appl., Dec. 5, 1980, PCT/JP80/00297; Apr. 30, 1981, PCT/JP81/00103; Aug. 21, 1981, PCT/JP81/00183; Sep. 24, 1981, PCT/JP81/00252

Int. Cl.[4] **C07D** *205/08, 403/12, 401/12;* **A61K** *31/395*

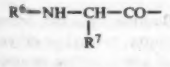
U.S. Cl. 514—210 **20 Claims**

1. A compound of the formula



wherein
R^1 represents
(1) amino,
(2) an acylated amino group wherein the acyl moiety is
(i) a group of the formula:

wherein R^5 is an alkyl other than C_{1-5} alkyl—CH_2 or a heterocyclic* group;
(ii) a group of the formula:



wherein R^6 is hydrogen, glycyl, alanyl, valyl, leucyl, isoleucyl, seryl, threonyl, cysteinyl, cystyl, methionyl, α- or β-aspartyl, α- or γ-glutamyl. lysyl, arginyl, phenylalanyl, phenylglycyl, tyrosyl, histidyl, tryptophanyl, an amino-protective group or a group R^8—$(CH_2)n_1$—CO— where R^8 is a heterocyclic* group and n_1 is an integer of 0 to 2, and R^7 is an alkyl, phenyl*, heterocyclic*-carbonylamino or a heterocyclic* group;
(iii) a group of the formula:

wherein R^9 is a group

where R^{11} is alkyl*, heterocyclic* group or phenyl* and R^{12} is hydrogen, an alkyl, alkenyl or a group —R^{13}—R^{14} where R^{13} is an alkylene or alkenylene and R^{14} is phenyl*, carboxyl or an alkyl ester thereof or mono- or di-alkylamino, and R^{10} is a direct bond or a group

where R^{15} is an alkyl, phenyl* or thiazolyl*;
(iv) a group of the formula:

wherein R^{16} is hydroxyl, hydroxysulfonyloxy, carboxy, ureido*, sulfamoyl*, sulfo, phenoxycarbonyl* or formyloxy and R^{17} is hydrogen, an alkyl, an alkoxy, halogen, nitro or hydroxy; or
(v) a group of the formula:
ti R^{18}—R^{19}—CH_2—CO—
wherein R^{18} is cyano, phenyl*, phenoxy*, an alkyl*, alkenyl* or a heterocyclic* group and R^{19} is a direct bond or —S—;
and, in symbols R^5 through R^{19},
(a) the heterocyclic group is 2- or 3-pyrrolyl, 2- or 3-furyl, 2- or 3-thienyl, 2- or 3-pyrrolidinyl, 2-, 3- or 4-pyridyl, N-oxido-2-, 3- or 4-pyridyl, 2-, 3- or 4-piperidinyl, 2-, 3- or 4-pyranyl, 2-, 3- or 4-thiopyranyl, pyrazinyl, 2-, 4- or 5-thiazolyl, 2-, 4- or 5-oxazolyl, 3-, 4- or 5-isothiazolyl, 3-, 4- or 5-isoxazolyl, 2-, 4- or 5-imidazolyl, 3-, 4- or 5-pyrazolyl, 3- or 4-pyridazinyl, N-oxido-3- or 4-pyridazinyl, 2-, 4- or 5-pyrimidinyl, N-oxido-2-, 4- or 5-pyrimidinyl, piperazinyl, 4- or 5-(1,2,3-thiadiazolyl), 3- or 5-(1,2,4-thiadiazolyl), 1,3,4-thiadiazolyl, 1,2,5-thiadiazolyl, 4- or 5-(1,2,3-oxadiazolyl), 3- or 5-(1,2,4-oxadiazolyl), 1,3,4-oxadiazolyl, 1,2,5-oxadiazolyl, 1,2,3- or 1,2,4-triazolyl, 1H- or 2H-tetrazolyl, pyrido[2,3-d]-pyrimidyl; benzopyranyl; 1,8-, 1,5-, 1,6-, 1,7-, 2,7- or 2,6-naphthyridyl; quinolyl or thieno[2,3-b]-pyridyl,
(b) the amino-protective group in R^6 is phthaloyl, p-nitrobenzoyl, p-tert-butyl-benzoyl, p-tert-butylbenzenesulfonyl, benzenesulfonyl, toluenesulfonyl, formyl, acetyl, propionyl, monochloroacetyl, dichloroacetyl, trichloroacetyl, methanesulfonyl, ethanesulfonyl, trifluoroacetyl, maleyl, succinyl, methoxycarbonyl, ethoxycarbonyl, t-butoxycarbonyl, isopropoxycarbonyl, 2-cyanoethoxycarbonyl, β,β,β-trichloroethoxycarbonyl, β-trimethylsilylethoxycarbonyl,

β-methylsulfonylethoxycarbonyl, benzyloxycarbonyl, p-nitrobenzyloxycarbonyl, p-methoxybenzyloxycarbonyl, diphenylmethyloxycarbonyl, methoxymethyloxycarbonyl, acetylmethyloxycarbonyl, isobornyloxycarbonyl, phenyloxycarbonyl, trityl, 2-nitrophenylthio, benzylidene, 4-nitro benzylidene, trialkylsilyl, benzyl or p-nitrobenzyl,

(c) the heterocyclic, phenyl, thiazolyl, phenoxycarbonyl and phenoxy with a superscript asterisk "*" may be substituted with one to three substituents from the group consisting of alkyl, alkoxy, alkenyl, aryl, aralkyl, mercapto, alkylthio, arylthio, aralkylthio, alkylsulfonyl, arylsulfonyl, aralkylsulfonyl, mono- to trihaloalkyl, hydroxyl, oxo, thioxo, halogen, nitro, amino cyano, carbamoyl, carboxyl, acyl, acyloxy, acylamino, hydroxyalkyl, carboxyalkyl, and mono- or dialkylaminoalkyl, wherein the acyl and the acyl moiety of the acyloxy and acylamino are C_{1-6} alkylcarbonyl; benzoyl which may be substituted with hydroxyl or methoxy; C_{7-9} aralkylcarbonyl which may be substituted with hydroxyl or methoxy; 2-thienylcarbonyl; 2-furylcarbonyl; 2-, 4- or 5-thiazolylacetyl; 2- or 3-thienylacetyl; 2- or 3-furylacetyl or 2-amino-4- or 5-thiazolylacetyl,

(d) the alkyl with a superscript asterisk "*" may be substituted with one to three substituents selected from halogen, hyroxyl, cyano and trifluoromethyl,

(e) the ureido with a superscript asterisk "*" may be substituted with sulfo in the form of salt with sodium or potassium, carbamoyl, sulfamoyl, amidino or alkyl,

(f) the sulfamoyl with a superscript asterisk "*" may be substituted with an alkyl or amidino, and

(g) the alkenyl with a superscript asterisk "*" may be substituted with one to three substituents selected from carboxyl and cyano,

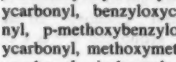
wherein the amino group, the carboxyl group and the hydroxyl group may be protected, or

(3) amino protected with phthaloyl, p-nitrobenzoyl, p-tert-butylbenzoyl, p-tert-butylbenzenesulfonyl, benzenesulfonyl, toluenesulfonyl, formyl, monochloroacetyl, dichloroacetyl, trichloroacetyl, methanesulfonyl, ethanesulfonyl, trifluoroacetyl, maleyl, succinyl, methoxycarbonyl, ethoxycarbonyl, t-butoxycarbonyl, isopropoxycarbonyl, 2-cyanoethoxycarbonyl, β,β,β-trichloroethoxycarbonyl, β-trimethylsilylethoxycarbonyl, β-methylsulfonylethoxycarbonyl, benzyloxycarbonyl, p-nitrobenzyloxycarbonyl, p-methoxybenzyloxycarbonyl, di-phenylmethyloxycarbonyl, methoxymethyloxycarbonyl, acetylmethyloxycarbonyl, isobornyloxycarbonyl, phenyloxycarbonyl, trityl, 2-nitrophenylthio, benzylidene, 4-nitrobenzylidene, trialkylsilyl, benzyl or p-nitrobenzyl,

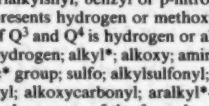
X represents hydrogen or methoxy, and

one of Q^3 and Q^4 is hydrogen or alkyl*, and the other of them is hydrogen; alkyl*; alkoxy; amino; aralkyl*; aryl*; heterocyclic* group; sulfo; alkylsulfonyl; aralkyl*-sulfonyl; aryl*-sulfonyl; alkoxycarbonyl; aralkyl*-oxycarbonyl; aryl*-oxycarbonyl; a group of the formula:

R^5—CO—,



R^9—R^{10}—CO—,



R^{18}—R^{19}—CH_2—CO—;

phthaloyl; p-nitrobenzoyl; p-tert-butylbenzoyl; formyl; monochloroacetyl; dichloroacetyl; trichloroacetyl; trifluoroacetyl; maleyl; succinyl; 2-cyanoethoxycarbonyl; β,β,β-trichloroethoxycarbonyl; β-trimethylsilylethoxycarbonyl; β-methylsulfonylethoxycarbonyl; di-phenylmethyloxycarbonyl; methoxymethyloxycarbonyl; acetylmethyloxycarbonyl; isobornyloxycarbonyl; trityl; 2-nitrophenylthio; benzylidene; 4-nitrobenzylidene or trialkylsilyl, wherein the alkyl*, the heterocyclic*, R^5, R^6, R^7, R^9, R^{10}, R^{16}, R^{17}, R^{18} and R^{19} are as defined above in the group R^1, and the aralkyl* and aryl* are respectively aralkyl and aryl which may be substituted with the substituents as mentioned above in the heterocyclic* group in the group R^1, and, in the groups represented by R^1, Q^3 and Q^4, the alkyl and alkoxy group have 1 to 6 carbon atoms, the alkenyl group has 2 to 6 carbon atoms, the alkylene group has 1 to 3 carbon atoms, the alkenylene group has 2 to 4 carbon atoms, the aryl group has 6 to 14 carbon atoms, and the aralkyl group has 7 to 11 carbon atoms, or a pharmaceutically acceptable salt or an alkoxymethyl ester, α-alkoxyethyl ester, alkylthiomethyl ester, pivaloyloxymethyl ester, α-acetoxybutyl ester, ethoxycarbonyloxymethyl ester or α-ethoxycarbonyloxyethyl ester formed at the carboxyl group or groups contained in R^1 and/or Q^3 and Q^4 thereof.

5. An antibacterial composition which contains as an active ingredient an antibacterially effective amount of a compound or a salt or ester thereof as defined in claim 1 together with a suitable carrier or carriers therefor.

4,550,106

4-PHENYL-4,5,6,7-TETRAHYDRO-THIENO[2,3-C]PYRIDINES AND SALTS THEREOF, COMPOSITIONS AND USE

Claus Schneider, Ingelheim am Rhein; Gerhard Walther, Bingen; Karl-Heinz Weber, Gau-Algesheim; Wolf D. Bechtel, Appenheim, and Karin Böke-Kuhn, Gau-Algesheim, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

Division of Ser. No. 466,100, Feb. 14, 1983, Pat. No. 4,482,559.

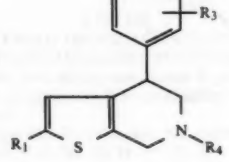
This application Jul. 23, 1984, Ser. No. 630,376

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1982, 3207939

Int. Cl.[4] **A61K** *31/44, 31/535;* **C07D** *495/04*

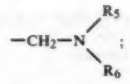
U.S. Cl. 514—212 **7 Claims**

1. A compound of the formula



wherein

R_1 is amino,



R_2 and R_3 are each hydrogen, fluorine, chlorine, bromine, trifluoromethyl, hydroxyl, methoxy, methyl or ethyl;

R_4 is straight or branched alkyl of 1 to 3 carbon atoms; and

R_5 and R_6 are each hydrogen or alkyl of 1 to 4 carbon atoms or, together with each other and the nitrogen atom to

which they are attached, form a 5-, 6- or 7-membered heterocyclic ring, a —CH_2— group in the ring may be replaced by an oxygen atom,

or a non-toxic, pharmacologically acceptable salt thereof.

6. An antidepressant pharmaceutical composition consisting essentially of an inert pharmaceutical carrier and an effective antidepressant amount of a compound of claim **1**.

4,550,107

CONDENSED DIAZEPINONES, THEIR COMPOSITIONS AND METHODS OF USE AS PHARMACEUTICALS

Wolfhard Engel, Biberach; Günter Trummlitz, Warthausen; Wolfgang Eberlein, Biberach; Gerhard Mihm, Biberach; Günther Schmidt, Biberach; Rüdolf Hammer, Ingelheim am Rhein, all of Fed. Rep. of Germany, and Antonio Giachetti, Milan, Italy, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

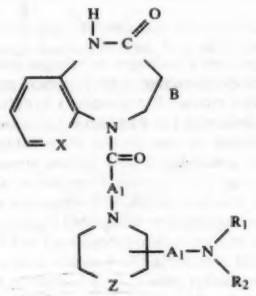
Filed Mar. 14, 1985, Ser. No. 711,913

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1984, 3409237

Int. Cl.[4] A61K *31/55;* **C07D** *521/00*

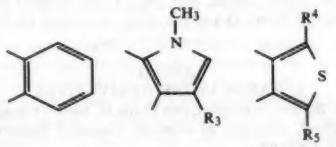
U.S. Cl. 514—220 **11 Claims**

1. A compound having the formula



wherein

B is a fused ring selected from



X is —CH— or, when B is ortho-phenylene, it can alternatively be nitrogen;

A_1 is C_1–C_2 alkylene;

A_2 is C_1–C_2 alkylene when it is in the 2-position relative to the saturated heterocyclic ring nitrogen or a single bond or methylene, when it is in the 3- or 4-position;

R_1 is C_1–C_3 alkyl;

R_2 is C_1–C_7 alkyl, optionally hydroxy substituted on at least one of its second to seventh carbon, or C_3–C_7 cycloalkyl, optionally hydroxy substituted, or C_3–C_7 cycloalkylmethyl; or

R_1 and R_2 can, together with the nitrogen therebetween, be a 4- to 7- membered saturated, monocyclic, heterocyclic ring which can optionally include an oxygen or N—CH_3;

R_3 is hydrogen, chlorine or methyl;

R_4 is hydrogen or C_1–C_4 alkyl;

R_5 is hydrogen, chlorine, or C_1–C_4 alkyl and

Z is a single bond, oxygen, methylene or 1,2-ethylene group, the diastereoisomers and enantiomers thereof and the NR_1R_2-N oxides and physiologically acceptable acid addition salts thereof with inorganic or organic acids.

11. A method of treating bradyarrhythmia in a mammal in need thereof which comprises administering an effective amount of a compound of any of claims **1** to **7** to said mammal.

4,550,108

1,3,5-OXADIAZINE-2,4-DIONES AND PESTICIDAL USE

Manfred Böger, Weil am Rhein, Fed. Rep. of Germany, and Jozef Drabek, Oberwil, Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

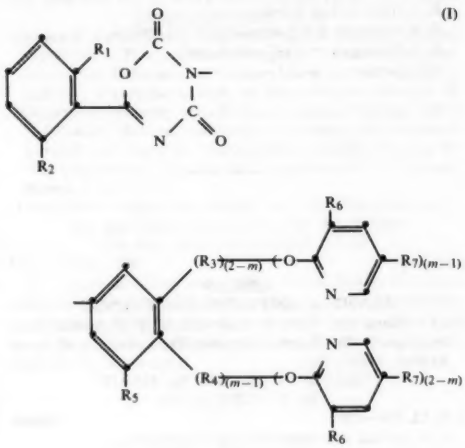
Filed Aug. 9, 1984, Ser. No. 639,039

Claims priority, application Switzerland, Aug. 17, 1983, 4487/83; Apr. 13, 1984, 1861/84; Jul. 13, 1984, 3424/84

Int. Cl.[4] A01N *43/88;* **C07D** *413/10*

U.S. Cl. 514—232 **17 Claims**

1. A compound of the formula I



(I)

wherein

R_1 is halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy or C_1–C_4-alkylthio,

R_2 is hydrogen, halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy or C_1–C_4-alkylthio,

R_3 and R_4 are each hydrogen, halogen or C_1–C_4-alkyl,

R_5 is hydrogen, halogen, C_1–C_4-alkyl or —$COOR_8$,

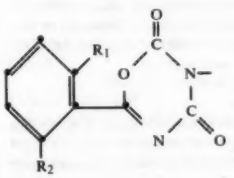
R_6 is hydrogen or halogen,

R_7 is mono- or polyhalogenated C_1–C_4-alkyl,

R_8 is hydrogen or C_1–C_4-alkyl, and

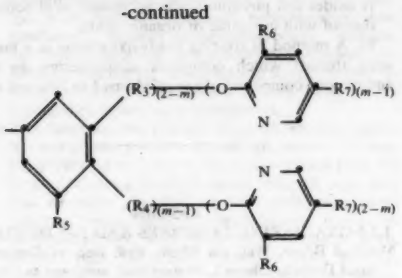
m is 1 or 2.

15. A method of controlling pests on animals and plants, which method comprises applying thereto or to the locus thereof an effective amount of a compound of the formula I



(I)

-continued



wherein

R_1 is halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy or C_1–C_4-alkylthio,

R_2 is hydrogen, halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy or C_1–C_4-alkylthio,

R_3 and R_4 are each hydrogen, halogen or C_1–C_4-alkyl,

R_5 is hydrogen, halogen, C_1–C_4-alkyl or —$COOR_8$,

R_6 is hydrogen or halogen,

R_7 is mono- or polyhalogenated C_1–C_4-alkyl,

R_8 is hydrogen or C_1–C_4-alkyl, and

m is 1 or 2.

4,550,109

LIPOIDAL BIOPTERIN COMPOUNDS

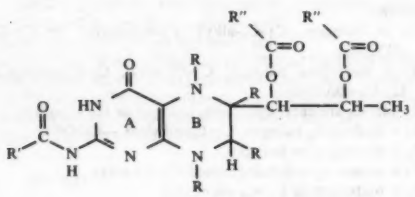
Karl Folkers, and Klaus P. Laesecke, both of Austin, Tex., assignors to The Board of Regents, The University of Texas System, Austin, Tex.

Filed May 31, 1984, Ser. No. 615,812

Int. Cl.[4] C07D *241/00*

U.S. Cl. 514—249 **7 Claims**

1. A lipoidal compound having the formula:



wherein

—R is absent when there are two double bonds in ring B;

—R is hydrogen when the two double bonds in ring B are absent; and

—R′ and R″ are independently saturated or unsaturated, aliphatic hydrocarbon groups which are balanced in molecular weight such that they confer to the lipoidal compound a lipoidal property, and wherein

—R′ has 8 to 19 carbon units and

—R″ has 1 to 3 carbon units.

7. A method of treating brain-related biopterin deficiencies which comprises administering to a patient in need of such treatment a pharmaceutically effective amount of a compound of claim 1.

4,550,110

6-(1,8-NAPHTHYRIDIN-2-YL)-DITHIINO[1,4][2,3-C]-PYRROLES USEFUL AS TRANQUILLIZERS AND ANTICONVULSANTS

Daniel Farge, Thiais; André Léger, Paris, and Gerard Ponsinet, Sucy-en-Brie, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

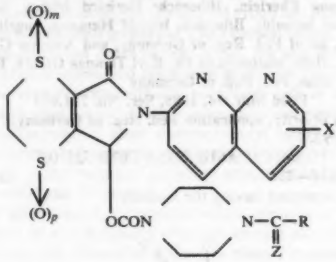
Filed Apr. 21, 1983, Ser. No. 487,133

Claims priority, application France, Apr. 22, 1982, 82 06944

Int. Cl.[4] C07D *401/14*; A61K *31/495*

U.S. Cl. 514—254 **6 Claims**

1. A pure [1,4][2,3-c]pyrrole of the formula:



wherein X represents a hydrogen or halogen atom, or an alkyl or alkoxy radical containing 1 to 4 carbon atoms, a cyano radical or a nitro radical, R represents a hydgrogen atom, an alkyl radical containing 1 to 4 carbon atoms which is unsubstituted or substituted by one, two or three halogen atoms, an alkenyl radical containing 2 to 4 carbon atoms, an alkynyl radical containing 2 to 4 carbon atoms or an alkoxy radical containing 1 to 4 carbon atoms, or R represents a phenyl radical which is unsubstituted or substituted by one, two or three halogen atoms, an alkyl radical containing 1 to 4 carbon atoms, an alkoxy radical containing 1 to 4 carbon atoms, a nitro radical or a trifluoromethyl radical, or R represents a phenylalkyl radical in which the alkyl moiety contains 1 to 4 carbon atoms, or a phenylalkynyl radical in which the alkynyl moiety contains 2 to 4 carbon atoms, and in which the phenyl nuclei are optionally substituted as indicated above, Z represents an oxygen or sulphur atom, and one of the symbols m and p represents the figure O and the other represents the figure l.

4,550,111

ALKANOLAMINE DERIVATIVES

Jeffrey J. Barlow, Stockport, and Leslie H. Smith, Cheadle, both of England, assignors to Imperial Chemical Industries plc, London, England

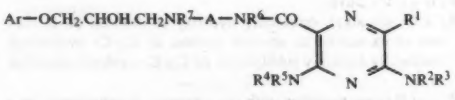
Filed Jan. 19, 1983, Ser. No. 459,142

Claims priority, application United Kingdom, Jan. 29, 1982, 8202596

Int. Cl.[4] C07D *237/12, 237/20*; A61K *31/495*

U.S. Cl. 514—255 **9 Claims**

1. A compound of the formula



wherein Ar is phenyl or naphthyl which is unsubstituted or which bears one or two substituents selected from halogen, trifluoromethyl, hydroxy, amino, nitro, carbamoyl and cyano, and alkyl, alkenyl, alkoxy, alkenyloxy, alkylthio, alkanoyl, carbamoylalkyl and alkanoylamino each of up to 6 carbon atoms, or Ar is 4- or 5-indanyl, 5- or 6-(1,2,3,4-tetrahydronaphthyl) or 2,3-dihydroxy-1,2,3,4-tetrahydronaphth-5-yl;

wherein R^1 is halogen, cyano, trifluoromethyl or trifluoromethylthio;
wherein either R^2 and R^3, which may be the same or different, each is hydrogen or alkyl of up to 6 carbon atoms; or R^2 is hydrogen and R^3 is cycloalkyl of 3 to 6 carbon atoms or cycloalkyl-alkyl wherein cycloalkyl is of 3 to 6 carbon atoms and alkyl is of up to 6 carbon atoms;
wherein R^4 is hydrogen and R^5 is hydrogen or alkyl of up to 6 carbon atoms;
wherein R^6 and R^7, which may be the same or different, each is hydrogen or alkyl of up to 6 carbon atoms;
and wherein A is alkylene of 2 to 6 carbon atoms; or an acid-addition salt thereof.

8. A method for the treatment of heart disease or hypertension in a warm-blooded animal which comprises administering to said animal an effective amount of at least one compound claimed in claim **1**.

4,550,112

3,7-DIAZABICYCLO(3,3,1)NONANE COMPOUNDS AND THEIR USE IN TREATING HEART DISEASE

Uwe Schoen, Hanover; Bernd Hachmeister, Isernhagen; Wolfgang Kehrbach, Hanover; Ulrich Kuehl, Gehrden, and Gerd Buschmann, Hanover, all of Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH, Hanover, Fed. Rep. of Germany

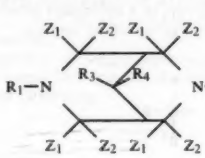
Filed Sep. 16, 1983, Ser. No. 532,762

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1982, 3234697

Int. Cl.[4] **A61K** *31/445;* **C07D** *471/08, 471/10*

U.S. Cl. 514—278 **24 Claims**

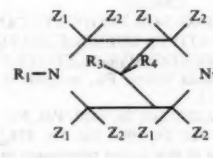
1. A compound represented by the formula I



I

wherein
Z_1 and Z_2 each denotes hydrogen,
R_1 and R_2 each denotes (A) a substituent which contains up to 12 carbon atoms and which is selected from the group consisting of alkyl, alkenyl, and alkinyl, or (B) a cycloalkyl group containing 3 to 6 carbon atoms which is attached to the nitrogen atom directly or by an alkylene group containing 1 to 3 carbon atoms, and
R_3 and R_4 each denotes an alkyl group containing up to 7 carbon atoms, or both together form an alkylene chain represented by the formula $—(CH_2)_n—$, wherein n is an integer ranging between 3 and 6,
such that the substituents R_1, R_2, R_3, and R_4 together contain at least 6 carbon atoms.

24. A method for treating cardiac arrhythmias and ischemic heart disease, comprising the step of administering a therapeutically effective amount of (1) at least one compound represented by formula I



wherein
Z_1 and Z_2 each denotes hydrogen,
R_1 and R_2 each denotes (A) a substitutent which contains up to 12 carbon atoms and which is selected from the group consisting of alkyl, alkenyl, and alkinyl, or (B) a cycloalkyl group containing 3 to 6 carbon atoms which is attached to the nitrogen atom directly or by an alkylene group containing 1 to 3 carbon atoms, and
R_3 and R_4 each denotes an alkyl group containing up to 7 carbon atoms, or both together form an alkylene chain represented by the formula $—(CH_2)_n—$, wherein n is an integer ranging between 3 and 6,
such that the substituents R_1, R_2, R_3 and R_4 together contain at least 5 carbon atoms;
or (2) a pharmaceutically acceptable acid addition salt of said compound.

4,550,113

9-AMINO-2,3,5,6,7,8-HEXAHYDRO-1H-CYCLOPENTA(B-)QUINOLINE MONOHYDRATE HYDROCHLORIDE AS STIMULANT OF NEURO-MUSCULAR TRANSMISSION OF SMOOTH MUSCLES

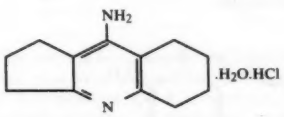
Elionora F. Lavretskaya, Moscow; Ernest A. Rudzit, Moskovskaya; Lev A. Piruzian, Moscow; Ljubov I. Volkova, Moskovskaya; Nina I. Zakharova, Moscow; David A. Sarkisian; Alexandra V. Upadysheva, both of Moskovskaya; Natalya D. Grigorieva, Moscow; Anna P. Znamenskaya, Moscow; Rakhil E. Libinzon, Moscow, and Semen G. Antonian, Moscow, all of U.S.S.R., assignors to Nauchno-Issledovatelsky Institut Po Biologicheskikm Ispytaniyam Khimicheskikh Soedineny, Kirova, U.S.S.R.

Continuation of Ser. No. 409,606, Aug. 19, 1982, abandoned. This application Feb. 6, 1984, Ser. No. 577,304

Int. Cl.[4] **A61K** *31/47;* **C07D** *221/16*

U.S. Cl. 514—290 **9 Claims**

1. A pharmaceutical composition which blocks the potassium channels of the excitable membranes and inhibits choline esterase comprising an effective amount of 9-amino-2,3,5,6,7,8-hexahydro-1H-cyclopenta(b)quinoline monohydrate hydrochloride of the formula:



as the active ingredient and a pharmaceutical carrier.

4,550,114

BENZOQUINOLIZINES AS α_2-ADRENOCEPTOR ANTAGONISTS

John F. White, Wokingham, England, assignor to John Wyeth & Brother limited, Maidenhead, England

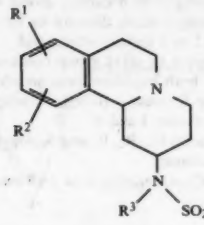
Filed Jan. 3, 1984, Ser. No. 567,469

Claims priority, application United Kingdom, Jan. 29, 1983, 8302499

Int. Cl.[4] **A61K** *31/47;* **C07D** *455/06*

U.S. Cl. 514—294 **9 Claims**

9. A method of selectively antagonising α_2-adrenoceptors in warm blooded animals which comprises administering to the animal an effective amount of a compound selected from the group consisting of a benzoquinolizine of the formula



(I)

and a pharmaceutically acceptable acid addition salt thereof, wherein R^1 and R^2 which may be the same or different each represent hydrogen, lower alkyl, lower alkoxy or halogen, R^3 represents hydrogen or lower alkyl and R^4 represents a heterocyclic radical attached to the SO_2 group through a carbon atom of the heterocyclic ring selected from the group consisting of substituted or unsubstituted quinoline, furan, thiophene, pyridine, imidazole, indolyl or 1,2,3,4-tetrahydroquinoline, and said substituents are selected from the group consisting of halogen, lower alkoxy, lower alkyl, lower alkylenedioxy, amino, lower alkylamino, diloweralkylamino, trifluoromethyl, carbamoyl, phenyl or phenyl substituted by one or more of the R^4 heterocyclic radical substituents.

4,550,115

CERTAIN PIPERIDINO-LOWER-ALKYLENE ESTERS OF 3-METHYLFLAVONE-8-CARBOXYLATES POSSESSING SMOOTH MUSCLE RELAXANT ACTIVITY

Dante Nardi; Alberto Tajana; Renzo Pennini, all of Milan; Pietro Cazzulani, Casal Pusterlengo; Gabriele Graziani, Arese, and Silvano Casadio, Milan, all of Italy, assignors to Recordati S.A., Chemical & Pharmaceutical Company, Chiasso, Switzerland

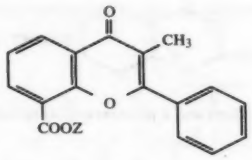
Filed Jul. 12, 1982, Ser. No. 397,196

Claims priority, application United Kingdom, Jul. 17, 1981, 8122158

Int. Cl.[4] C07D *311/30;* **A61K** *31/445*

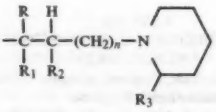
U.S. Cl. 514—320 **19 Claims**

1. A 3-methylflavone-8-carboxylic acid ester having the structural formula (I):



(I)

wherein Z is N-methylpiperidinyl or a group having the structural formula (II):



(II)

in which n is 0 or 1 R is hydrogen or alkyl having from 1 to 4 carbon atoms, R_1 is hydrogen or alkyl having from 1 to 4 carbon atoms, R_2 is hydrogen or hydroxy, and R_3 is hydrogen or alkyl having from 1 to 4 carbon atoms, with the proviso that R, R_1, R_2 and R_3 cannot at the same time all be hydrogen; and the pharmaceutically acceptable salts thereof.

18. The method for eliciting a smooth muscle relaxant response in a warm-blooded mammal, comprising administering to a warm-blooded mammal in need of such treatment, a therapeutically effective amount of the 3-methylflavone-8-carboxylate as defined by claim **1**, or pharmaceutically acceptable salt thereof.

4,550,116

PIPERIDINE DERIVATIVES

Jose M. P. Soto; Armando V. Noverola; Jacinto M. Mauri, all of Barcelona, and Robert G. W. Spickett, Tibadabo, all of Spain, assignors to Fordonal, S.A., Madrid, Spain

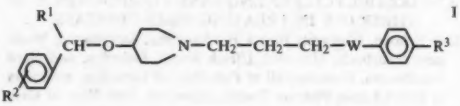
Filed Jul. 24, 1984, Ser. No. 633,958

Claims priority, application United Kingdom, Aug. 5, 1983, 8321157

Int. Cl.[4] A61K *31/445;* **C07D** *211/46, 409/04*

U.S. Cl. 514—327 **10 Claims**

1. A compound of the formula I:



I

wherein R^1 represents a thienyl group, or a phenyl group optionally substituted by a halogen (preferably fluorine or chlorine) atom, a lower alkoxy or lower alkyl group, R^2 represents a hydrogen or halogen (preferably fluorine) atom, a lower alkoxy or lower alkyl group, R^3 represents a hydrogen or halogen (preferably fluorine) atom, a lower alkylthio, lower alkoxy or lower alkyl group, or a cycloalkyl group containing 5 or 6 carbon atoms, or a group of the formula:

II

wherein R^4 and R^5 singly each represents a hydrogen atom or lower alkyl group, R^6 represents a cycloalkyl containing 3 to 6 carbon atoms, hydroxymethyl, carboxy or lower alkoxycarbonyl group, and W represents a carbonyl

or a hydroxymethylene [viz. —CH(OH)—] group, and pharmacologically acceptable salts thereof.

10. A method for the treatment of symptoms of respiratory, allergic or cardiovascular disease states in a host which comprises administering to the host an effective amount of a compound or salt according to claim **1**.

4,550,117

3-CYCLOALKYLAMINO-2-OR-PROPOXYCYANOPYRIDINES, DERIVATIVES THEREOF, HAVING ANTI-HYPERTENSIVE ACTIVITY

John J. Baldwin, Gwynedd Valley, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

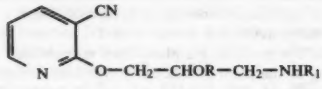
Division of Ser. No. 401,454, Jul. 26, 1982, Pat. No. 4,436,740. This application Jan. 26, 1984, Ser. No. 574,112

The portion of the term of this patent subsequent to Mar. 13, 2001, has been disclaimed.

Int. Cl.[4] C07D *213/57;* **A61K** *31/44*

U.S. Cl. 514—344 **6 Claims**

1. A compound having the formula:



and pharmaceutically acceptable salts thereof wherein:

R is H or

wherein L is C_1–C_{10} alkyl, phenyl or substituted phenyl having one or two substituents which are independently selected from C_{1-4} alkyl, C_{1-4} alkoxy or halo; and

R_1 is indanyl, C_5C_8 cycloalkyl or substituted C_5–C_8 cycloalkyl wherein the substituent is mono- or diloweralkyl.

6. A method of treating hypertension in humans in need of such treatment by administering an antihypertensively effective amount of a compound of claim 1, said amount being in the range of from about 10 mg. to 2000 mg.

4,550,118

HETEROCYCLIC COMPOUNDS

Toshiya Sugino; Fujio Nohara; Tomoaki Fujinawa; Kazuo Ogawa; Teruo Mizukami, and Shunichi Shirai, all of Toyama, Japan, assignors to Ikeda Mohando Co., Ltd., Toyama and Otsuka Pharmaceutical Co., Ltd., Tokyo, both of, Japan

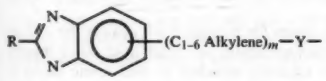
Filed Oct. 24, 1983, Ser. No. 544,591

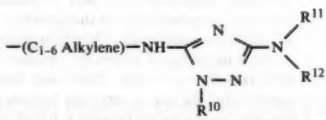
Claims priority, application Japan, Oct. 26, 1982, 57-188876

Int. Cl.[4] **C07D** *401/14, 403/12, 413/14;* **A61K** *31/41, 31/415, 31/44, 31/54, 31/535*

U.S. Cl. 514—383 **37 Claims**

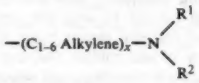
36. The method of treating peptic ulcers in a subject affected by peptic ulcers which consists of administering to said subject a compound of formula





wherein

R is (a) hydrogen; (b) C_{1-6}alkyl; (c) an unsubstituted amidino or a C_{1-6} alkyl substituted amidino; (d) an unsubstituted guanidino or a C_{1-6} alkyl substituted guanidino; (e) a



group wherein x is 0 or 1,

R^1 and R^2 are independently hydrogen or C_{1-6} alkyl, or

is an unsubstituted heterocyclic radical which is a member selected from the group consisting of (1) morpholino, (2) piperidino, (3) pyrrolidino, (4) piperazino, (5) thiomorpholino, and (6) morpholino, piperidino, pyrrolidino, piperazino, thiomorpholino substituted by C_{1-6} alkyl; Y is independently a —NH—, an —O—, or a —S—;

m is 0 or 1;

R^{10} is hydrogen, an unsubstituted phenyl or a phenyl substituted by C_{1-4} alkylenedioxy, C_{1-6} alkoxy or halogen, or a mono- or di-C_{1-6} alkylamino-C_{1-6} alkyl;

R^{11} and R^{12} are independently hydrogen, C_{1-6} alkyl or

is a heterocyclic radical which is a member selected from the group consisting of (1) morpholino, (2) piperidino, (3) pyrrolidino, (4) piperazino, (5) thiomorpholino, (6) pyridylideneimino and (7) morpholino, piperidino, pyrrolidino, piperazino, thiomorpholino, pyridylideneimino substituted by C_{1-6} alkyl,

and pharmaceutically compatible salts thereof, solvates and hydrates thereof in unit dosage form containing between 0.2 and 16 mg/kg of said compound with respect to the body weight of said subject.

4,550,119

2,4-DIHYDRO-5-[(SUBSTITUTED)PHENYL]-4,4-DISUBSTITUTED-3H-PYRAZOL-3-ONES

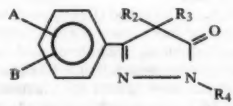
Glenn C. Morrison, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 497,316, May 23, 1983,. This application Mar. 12, 1984, Ser. No. 586,430

Int. Cl.[4] **A61K** *31/415;* **C07D** *403/10, 401/10*

U.S. Cl. 514—394 **5 Claims**

1. A compound of the formula



wherein R_2 and R_3 are independently alkyl of from one to six carbon atoms, R_4 is hydrogen or alkyl of from one to six carbon atoms; B is hydrogen and A is benzimidazole, tetrahydrobenzimidazole; and the pharmaceutically acceptable salts thereof.

4,550,120

7-OXABICYCLOHEPTANE SUBSTITUTED ETHERS AND THEIR USE IN TREATING THROMBOLYTIC DISEASE

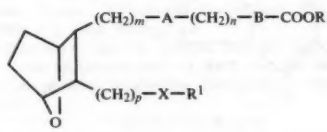
Jagabandhu Das, Plainsboro, and Steven E. Hall, Ewing Township, Mercer County, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 30, 1984, Ser. No. 605,535

Int. Cl.[4] **A61K** *31/34, 31/557;* **C07D** *307/00*

U.S. Cl. 514—469 **15 Claims**

1. A compound of the structure



including all stereoisomers thereof, wherein A is O or

B is a single bond or —CH=CH—; m is 1 or 2; n is 1 to 8; p is 1 to 5; X is O or

wherein q is 0, 1 or 2 when A is 0, and when either A or X is S then the other may not be

wherein q is 1 or 2; R is H, lower alkyl, alkali metal or tris(hydroxymethyl)aminomethane; and R^1 is lower alkyl, aryl, arylalkyl, cycloalkyl, cycloalkylalkyl or lower alkenyl, wherein the term lower alkyl or alkyl by itself or as part of another group contains 1 to 12 carbons and is unsubstituted or substituted with halo, trifluoromethyl, alkoxy, aryl, alkyl-aryl, haloaryl, cycloalkyl or alkylcycloalkyl;

the term aryl by itself or as part of another group contains 6 to 10 carbons and is unsubstituted or substituted with 1 or 2 lower alkyl groups, 1 or 2 halogens and/or 1 or 2 lower alkoxy groups;

the term cycloalkyl by itself or as part of another group contains 3 to 12 carbons and is unsubstituted or substituted with 1 or 2 halogens, 1 or 2 lower alkyl groups and/or 1 or 2 lower alkoxy groups;

the term lower alkenyl by itself or as part of another group contains 2 to 12 carbons; and

the term $(CH_2)_m$ includes 1 or 2 carbons in the normal chain, the term $(CH_2)_n$ includes 1 to 8 carbons in the normal chain and the term $(CH_2)_p$ includes 1 to 5 carbons in the normal chain, and

the terms $(CH_2)_m$, $(CH_2)_n$ and $(CH_2)_p$ may be unsubstituted or include one or more lower alkyl substituents.

10. A method of inhibiting arachidonic acid-induced platelet aggregation and bronchoconstriction, which comprises administering to the circulatory system of a mammalian host an effective amount of a compound as defined in claim **1** or a pharmaceutically acceptable salt thereof.

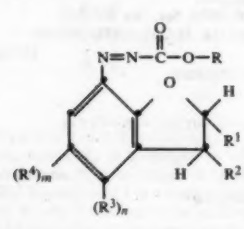
4,550,121

(2-SUBSTITUTED-2,3-DIHYDROBENZO-FURAN-7-YL)DIAZENECARBOXYLIC ACID ESTERS AND MITICIDAL METHOD

Kurt H. Pilgram, and Richard D. Skiles, both of Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 22, 1984, Ser. No. 643,329
Int. Cl.[4] A01N *47/10*; C07D *307/78*
U.S. Cl. 514—469 **4 Claims**

1. A compound of the Formula



(I)

wherein R contains from one to three carbon atoms and is alkyl, alkenyl or alkynyl; R^1 is alkyl of one to three carbon atoms or is methoxymethyl; R^2 is hydrogen or alkyl of one to three carbon atoms; R^3 and R^4 each is bromine, chlorine or alkyl of one to three carbon atoms; m is zero or one, n is zero or one, with the proviso that m+n=1 or 2.

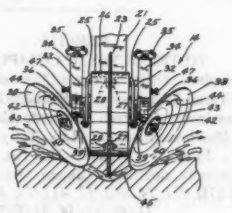
4. A method for protecting a plant from mites which comprises applying to the plant a miticidally effective dosage of a compound of claim **1**.

4,550,122

ATTACHMENT FOR REMOVING RESIDUE IN FRONT OF A PLANTER

John C. David, and Ward E. Ryon, both of Columbus, Nebr., assignors to Fleischer Manufacturing, Inc., Columbus, Nebr.

Filed Jul. 18, 1983, Ser. No. 514,888
Int. Cl.[4] A01C *5/06*
U.S. Cl. 172—158 **8 Claims**



8. A trash clearing apparatus for a planter of a type including:

a frame adapted to be moved forwardly above the soil;

planting means attached to said frame for depositing seeds in the soil;

trash hold down means for holding trash against the soil in front of said planting means, said trash hold down means being operably rotatably attached to said frame along a generally horizontal axis, said horizontal axis being substantially perpendicular to the direction of forward travel of said frame, said trash hold down means having a central portion including a generally circular peripheral coulter disc radially outwardly from said horizontal axis, said coulter disc having an extreme bottom portion;

a first disc means for cutting trash which is being held down by said trash hold down means, said first disc means being disposed directly to one side of said trash hold down means whereby said horizontal axis extends through said first disc means, said first disc means being operably rotatably attached to said frame along a second axis, said second axis being obliquely downwardly and outwardly disposed with respect to said first horizontal axis, the bottom of said first disc means being above the extreme bottom portion of said coulter disc; and

a second disc means for cutting trash which is being held by said trash hold down means, said second disc means being disposed directly on the other side of said trash hold down means, whereby said horizontal axis extends through said second disc means, said second disc means being operably rotatably attached to said frame along a third axis obliquely downwardly and outwardly disposed with respect to said horizontal axis, the bottom of said second disc means being above the extreme bottom portion of said coulter disc, whereby trash which might interfere with the planting process is cut up and removed from in front of the planting means.

4,550,123

THERMALLY PLASTIFIABLE COMPOSITIONS FOR MICROPOROUS SORBENT STRUCTURE

George Lopatin, Newton; Myron J. Coplan, Natick, and James P. Walton, Jr., Newton, all of Mass., assignors to Albany International Corp., Albany, N.Y.

Continuation of Ser. No. 531,623, Sep. 12, 1983, which is a division of Ser. No. 108,178, Dec. 28, 1979, Pat. No. 4,342,811. This application Jun. 1, 1984, Ser. No. 615,672

Int. Cl.[4] C08J 9/28

U.S. Cl. 521—64 4 Claims

1. A thermally plastifiable composition suitable for producing microporous polymeric bodies, having sorbent properties, comprising a mixture of

a thermally plastifiable polymer,

a diluent compatible with the polymer to form a uniform molten blend with the polymer at temperatures above the fusion temperature of said polymer and phase separable from the polymer into an interconnected fine distinct phase within the formed bodies upon cooling to room temperature and extractable therefrom to produce an open-cell microporous structure therein, and

activated carbon particles dispersed in the mixture and retaining a high degree of sorbent activity.

4,550,124

BLOWING AGENTS AND THEIR USE IN PREPARATIONS OF POLYESTER FOAMS

Helena Z. Kucharska, Rexdale, and Thomas M. Burton, Sarnia, both of Canada, assignors to Fiberglas Canada Inc., Toronto, Canada

Continuation-in-part of Ser. No. 607,047, May 4, 1984, Pat. No. 4,507,406. This application Feb. 7, 1985, Ser. No. 699,275

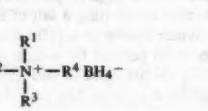
Claims priority, application Canada, Dec. 12, 1983, 443118

The portion of the term of this patent subsequent to Mar. 26, 2002, has been disclaimed.

Int. Cl.[4] C08J 9/06

U.S. Cl. 521—85 5 Claims

1. A foamable composition comprising an unsaturated polyester containing a promoter selected from the group consisting of a tertiary amine, a cobalt salt and a mixture thereof and a curing catalyst and a blowing agent comprising a quaternary ammonium borohydride of the formula:



where R^1, R^2 and R^3 may be the same or different and each is selected from alkyl, alkenyl, cycloalkyl, aryl, alkaryl and aralkyl groups and R^4 is selected from alkyl or alkenyl groups having from 1 to 30 carbon atoms.

4,550,125

FOAMABLE POLYORGANOSILOXANE COMPOSITIONS

Chi-Long Lee; Myron T. Maxson, and James A. Rabe, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Mar. 25, 1985, Ser. No. 715,807

Int. Cl.[4] C08V 9/14

U.S. Cl. 521—117 19 Claims

1. A foamable polyorganosiloxane composition exhibiting a viscosity of at least 0.5 Pa.s at 25° C., said composition consisting essentially of the product obtained by homogeneously blending together

(A) a polydimethylsiloxane containing at least two vinyl radicals per molecule and exhibiting a viscosity of from 0.1 to 100 Pa.s at 25° C.;

(B) an organohydrogensiloxane containing an average of at least 3 silicon-bonded hydrogen atoms per molecule in an amount sufficient to cure said composition in the presence of a hydrosilation catalyst;

(C) a catalytically effective amount of a platinum- or rhodium-containing hydrosilation catalyst,

(D) from 0.2 to 25%, based on the weight of said polyorganosiloxane composition, of a foam stabilizer consisting essentially of a resinous, benzene-soluble organosiloxane copolymer comprising $SiO_{4/2}$ units, $(CH_3)_3SiO_{1/2}$ units and fluorine-containing units selected from the group consisting of $R_aR'_bSiO_{(4-a-b)/2}$, $R''[Si(R')_bO_{(3-b)/2}]_2$ and combinations thereof, where R is a monovalent organic radical containing at least four perfluorinated carbon atoms, R' is an alkyl radical containing from 1 to 3 carbon atoms, R'' is a divalent organic radical containing at least four perfluorinated carbon atoms, R and R'' are bonded to the silicon atoms of their respective fluorine-containing units by means of a sequence of at least two methylene radicals or a silicon-bonded oxygen atom that is, in turn, bonded to a sequence of at least two methylene radicals, a is 1 or 2, b is 0, 1 or 2 and the sum of a and b is 3 or less, the molar ratio of all units other than hydroxyl and said $SiO_{4/2}$ units to said $SiO_{4/2}$ is from 0.7:1 to 1.1:1 inclusive, and the molar ratio of the $(CH_3)_3SiO_{1/2}$ units with respect to said fluorine-containing units and any remaining units other than said $SiO_{4/2}$ units is such that

(a) the surface tension exhibited by a 10% by weight solution of (D) in a trimethylsiloxy endblocked polydimethylsiloxane exhibiting a viscosity of 0.01 Pa.s at 25° C. is less than 2.2×10^{-4} newtons per cm at 25° C., and

(b) said 10% by weight solution requires the addition of from 0 to 5 weight % of xylene to achieve clarity at 25° C.;

(E) an amount of a blowing agent sufficient to convert said composition to a foam during exposure of said composition to atmospheric pressure and a temperature of at least 0° C.;

(F) when (C) is a platinum-containing catalyst, an amount of a catalyst inhibitor sufficient to deactivate said catalyst at temperatures up to about 50° C., and

(G) optionally, an amount of a microwave-sensitive material sufficient to generate the heat required to activate said hydrosilation catalyst in the presence of said inhibitor (F) and microwave radiation.

4,550,126

HYDROPHILIC, FLEXIBLE, OPEN CELL POLYURETHANE-POLY(N-VINYL LACTAM) INTERPOLYMER FOAM AND DENTAL AND BIOMEDICAL PRODUCTS FABRICATED THEREFROM

Donald H. Lorenz, Basking Ridge, N.J., assignor to Hydromer, Inc., Whitehouse, N.J.

Filed Jan. 25, 1985, Ser. No. 694,926

Int. Cl.[4] C08G 18/14

U.S. Cl. 521—159 25 Claims

1. A hydrophilic, flexible, open cell polyurethanepolyvinylpyrrolidone interpolymer foam obtained from the process which comprises reacting under interpolymer and foam-forming conditions (a) a substantially linear isocyanate-capped polyether polyol prepolymer having an average reactive functionality of less than about 2.0 with (b) a poly(N-vinyl lactam) and (c) a foam-forming amount of water in the presence of (d) a cell formation-regulating amount of surface active agent.

4,550,127

COMPOSITION AND METHOD FOR FORMING MOLDED AND CAST MACHINE PARTS

Hansjörg Renker, Hilterfingen, Switzerland, assignor to Fritz Studer AG, Thun, Switzerland

Continuation of Ser. No. 154,314, May 29, 1980, abandoned. This application Aug. 15, 1984, Ser. No. 641,358

Claims priority, application Switzerland, May 29, 1979, 4966/79

Int. Cl.[4] C08K 9/06

U.S. Cl. 523—212 7 Claims

1. A moldable or castable composition consisting essentially

of a mixture of 6 to 14% by weight of the total composition of an epoxy resin based binder system, 2 to 7% by weight of an aliphatic polyamine hardener, 2 to 10% fibers, 5 to 15% rock power having an average size of less than 0.08 mm, 5 to 15% sand, 5 to 15% fine gravel of an average grain size of 3 to 6 mm and 30 to 60% gravel of grain size of 6 to 16 mm.

4,550,128

EPOXY COMPOSITION

Leroy N. Chellis, Endwell, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 16, 1984, Ser. No. 600,619
Int. Cl.[4] C08L *63/04*
U.S. Cl. 523—433 **12 Claims**

1. A composition of matter comprising:

(A) about 25 to about 30 parts by weight of a tetrabrominated diglycidyl ether of bisphenol-A having an epoxy equivalent weight of about 350 to about 450;

(B) about 10 to about 15 parts by weight of a second and different tetrabrominated diglycidyl ether of bisphenol-A having an epoxy equivalent weight of about 600 to about 750; and

(C) about 55 to about 65 parts by weight of at least one epoxidized non-linear novolak having at least six terminal epoxy groups.

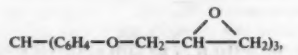
4,550,129

TOUGHENING REINFORCED EPOXY COMPOSITES WITH BROMINATED POLYMERIC ADDITIVES

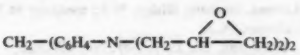
William J. Gilwee, Jr., Los Altos, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 12, 1983, Ser. No. 493,865
Int. Cl.[4] C08G *59/14;* **C08L** *63/04*
U.S. Cl. 523—433 **12 Claims**

1. An epoxy resin composition comprising a polyfunctional epoxy resin selected from the group consisting of TEN epoxy resin of formula



TGDDM epoxy resin of formula



and mixtures thereof admixed with a toughening amount of a brominated diglycidyl additive having an epoxy equivalence of from about 250 to about 1500 and a bromine content of about 50% by weight.

4,550,130

COMPOSITE MATERIAL WITH IMPROVED PROPERTIES

Kazuo Kishida, Otake; Isao Sasaki, Hiroshima; Hiroshi Mori, Iwakuni, and Yasuaki Ii, Otake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 450,378, Dec. 16, 1982,. This application Feb. 28, 1984, Ser. No. 584,400
Claims priority, application Japan, Dec. 28, 1981, 56-212583; May 24, 1982, 57-87779; May 24, 1982, 57-87780
Int. Cl.[4] C08K *7/00, 7/06, 7/22;* **C08L** *51/06*
U.S. Cl. 523—436 **15 Claims**

1. A polyolefin resin composition comprising:

(a) a polyolefin selected from the group consisting of polyethylene, polypropylene, poly(4-methylpentene-1), ethylene/vinyl acetate copolymer, ethylene/ethylacrylate copolymer, and ethylene/propylene/diene copolymer modified with from 0.05 to 0.8 parts by weight per 100 parts by weight of the polyolefin, of a grafted unsaturated carboxylic acid;

(b) no more than 10 weight %, based on the weight of said modified polyolefin, of a polyfunctional epoxide, polyfunctional amine, polyfunctional isocyanate or mixtures thereof with the proviso that the amount of any given polyfunctional agent is within the range of 0.03 to 5 wt. %; and

(c) from 5 to 400 wt. % of a reinforcing material, based on the weight of the modified polyolefin, of (i) a fibrous material selected from the group of glass fibers, carbon fibers, graphite fibers, aromatic polyamide fibers, silicon carbide fibers, polysulfone fibers, polyether ketone fibers, alumina fibers, potassium titanate fibers, asbestos fibers, boron fibers or metal fibers; or (ii) powdery or flaky materials selected from the group consisting of glass flakes, talc, mica, kaolin, clay, diatomaceous earth, calcium carbonate, calcium sulfate, magnesium oxide, carbon black, titanium oxide, powdered metal, alumina, graphite, white carbon, wollastonite, molybdenum disulfide and tungsten disulfide.

11. The composition of claim 1, wherein said polyfunctional epoxide is a bisphenol A epoxy compound, a bisphenol F epoxy compound, an aliphatic ether epoxy compound, a novolak epoxide or an isocyanurate epoxide.

4,550,131

AQUEOUS SLURRY PROCESS FOR PREPARING REINFORCED POLYMERIC COMPOSITES

Larry D. Yats, Clare, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 30, 1984, Ser. No. 666,027
Int. Cl.[4] C08K *3/40, 7/14;* **C08L** *1/00;* **B32B** *17/08*
U.S. Cl. 524—35 **11 Claims**

1. An improved process for preparing a reinforced polymeric composite in the absence of a flocculant comprising the steps of

(a) forming an alkaline aqueous slurry comprising

(i) a reinforcing material,

(ii) a heat fusible organic polymer, and

(iii) a binder comprising a salt of an ethylene acrylic acid copolymer having an acrylic acid content from about 12 to about 30 percent by weight copolymer solids; and

(b) adjusting the pH value of said slurry such that said binder is destabilized to coagulate said slurry.

4,550,132

PEROXIDE-CURABLE BROMINE-CONTAINING FLUOROELASTOMERS CONTAINING A SULFONE

Dante R. Capriotti, Cuyahoga Falls, Ohio, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 19, 1984, Ser. No. 590,838
Int. Cl.[4] C08K *5/45*
U.S. Cl. 524—84 **7 Claims**

1. In a peroxide-curable fluoroelastomer composition comprising an elastomeric copolymer containing units derived from vinylidene fluoride, units derived from at least one other fluorine-containing monomer copolymerizable with vinylidene fluoride, said monomer being a compound which contains no bromine atom, and contains at least as many fluorine atoms as carbon atoms and up to 3 mole percent of units derived from a bromine-containing olefin, with the proviso that enough of such olefin is present to provide at least about 0.05 weight percent bromine in the copolymer, the improvement which comprises the fluoroelastomer composition contains about 0.5–5 parts per hundred parts elastomeric copolymer of tetramethylene sulfone.

4,550,133

STABILIZED RED PHOSPHORUS AND ITS USE FOR FLAMEPROOFING THERMOPLASTIC POLYAMIDE MOULDING COMPOSITIONS

Werner Nielinger; Karl H. Hermann, and Dietrich Michael, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 8, 1984, Ser. No. 608,145

Claims priority, application Fed. Rep. of Germany, May 17, 1983, 3317822

Int. Cl.[4] C08K *3/32, 3/02*

U.S. Cl. 524—399 10 Claims

1. A powder-form red phosphorus stabilized against thermo-oxidative decomposition with at least one cadmium salt of carboxylic acid.

4,550,134

POLYOLEFIN RESIN COMPOSITION

Osamu Isogai, Ichihara, and Toshihumi Kagiya, Sodegaura, both of Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed Aug. 27, 1984, Ser. No. 644,784

Claims priority, application Japan, Sep. 13, 1983, 58-167522

Int. Cl.[4] C08K *3/34*

U.S. Cl. 524—413 15 Claims

1. A polyolefin resin composition which comprises 45 to 80% by weight of a polyolefin resin, 3 to 45% by weight of a muscovite having an aspect ratio of 5 to 50 and a weight-average particle diameter of 150 μm or less; and 1 to 50% by weight of titanium oxide; the weight ratio of said muscovite and said titanium oxide being from 0.1 to 5.0.

4,550,135

TIRE RUBBER COMPOSITION

Satoshi Iwama, Osaka, and Mitsuaki Hashiyama, Shiga, both of Japan, assignors to Toyo Tire & Rubber Co., Ltd., Osaka, Japan

Filed Jul. 20, 1984, Ser. No. 632,860

Claims priority, application Japan, Jul. 22, 1983, 58-134657

Int. Cl.[4] C08K *3/04;* C08L *9/06, 51/01*

U.S. Cl. 524—495 4 Claims

1. A rubber tire composition, comprising: from 20–150 parts by weight of carbon black incorporated in 100 parts by weight of rubber; said rubber comprising at least 30 parts by weight of a star type solution polymerized, random styrene-butadiene copolymer rubber and no more than 70 parts by weight of at least one other diene rubber, said random styrene-butadiene copolymer rubber comprising 10% to 20% by weight of styrene units and the balance of butadiene units; said styrene units having at least 40% by weight of the single isolated styrene units which are separated from each other and 5% by weight or less of the styrene units in the form of long chain blocks each consisting of 8 or more styrene units bound to each other, based on the entire weight of said styrene units in the copolymer; said butadiene units having 35% to 50% by mole of butadiene units in the form of 1,2-vinyl structure based on the entire mole of said butadiene units in the copolymer; said styrene-butadiene copolymer rubber having the ratio ($\overline{Mw}/\overline{Mn}$) of 1.2 to 3.5, wherein $\overline{Mw}$ and $\overline{Mn}$ represent the weight average and number average molecular weights, respectively; and said styrene-butadiene copolymer rubber having a coupling efficiency of 40% or more; and

said carbon black being a furnace carbon black having (1) a specific surface area (N_2SA) in the range of 75 to 105 as measured by nitrogen adsorption technique, (2) the difference between said N_2SA value and the measured iodine adsorption value (IA) being at least 15, as represented by the formula $N_2SA-IA \geqq 15$, and (3) the difference between said N_2SA value and the measured specific surface area (CTAB) as determined by the cetyltrimethylammonium bromide adsorption technique being not greater than 5, as represented by the formula $N_2SA-CTAB \leqq 5$; said furnace carbon black also having a dibutyl phthalate adsorption value (24M4 DBP) of not greater than 110 (ml/100 g) and a tinting strength (Tint) of 90 to 110, provided that the difference (Δ Tint) between the measured Tint and the calculated Tint of the furnace carbon black is not greater than −3, as represented by the formula (measured Tint)−(calculated Tint)$\leqq -3$.

4,550,136

METHOD FOR POLYMERIZING METHYL METHACRYLATE

Ludwig Hosch, Michelstadt, Fed. Rep. of Germany, assignor to Rohm GmbH, Darmstadt, Fed. Rep. of Germany

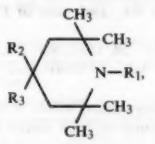
Continuation-in-part of Ser. No. 409,714, Aug. 19, 1982, abandoned, which is a continuation of Ser. No. 130,092, Mar. 13, 1980, abandoned. This application Sep. 27, 1982, Ser. No. 424,407

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1979, 2913853

Int. Cl.[4] C08F *120/14;* C08L *33/12*

U.S. Cl. 524—718 7 Claims

1. A method for making a methyl methacrylate polymer having high resistance to ultraviolet radiation and thermal damage, which method comprises polymerizing methyl methacrylate or a monomer mixture comprising at least 80 percent by weight of methyl methacrylate in the presence of a free radical-forming initiator and in the presence of 0.01 to 1 percent, by weight of the methyl methacrylate or monomer mixture, of a sterically hindered amine of the formula



wherein

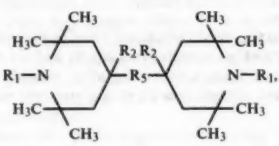
R_1 is hydrogen or alkyl having 1 to 4 carbon atoms,

R_2 taken alone is hydrogen or alkyl having 1 to 10 carbon atoms,

R_3 taken alone is alkyl having 1 to 10 carbon atoms, or

R_2 and R_3 taken together with the carbon atom to which they are attached form a 5- or 6-membered heterocycle wherein the hetero atoms are oxygen and/or nitrogen, or such a heterocycle substituted by alkyl and/or oxo.

2. A method for making a methyl methacrylate polymer having high resistance to ultraviolet radiation and thermal damage, which method comprises polymerizing methyl methacrylate or a monomer mixture comprising at least 80 percent by weight of methyl methacrylate in the presence of a free radical-forming initiator and in the presence of 0.01 to 1 percent, by weight of the methyl methacrylate or monomer mixture, of a sterically hindered amine of the formula



wherein

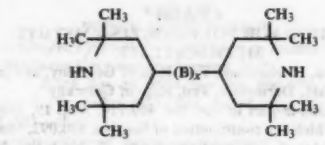
R_1 is hydrogen or alkyl having 1 to 4 carbon atoms,

R_2 is hydrogen or alkyl having 1 to 10 carbon atoms, and

R_5 is —O—CO—Hydrocarbon—CO—O—, wherein Hydrocarbon is alkylene having 2 to 20 carbon atoms or such alkylene substituted by phenyl or by substituted phenyl.

7. A method for making a methyl methacrylate polymer having high resistance to ultraviolet radiation and thermal

damage, which method comprises polymerizing methyl methacrylate or a monomer mixture comprising at least 80 percent by weight of methyl methacrylate in the presence of a free radical-forming initiator and in the presence of 0.01 to 1 percent, by weight of the methyl methacrylate or monomer mixture, of a sterically hindered amine of the formula



wherein B is $-O-CO-(CH_2)_y-CO-O-$, x is 0 or 1, and y is an integer between 2 and 10.

4,550,137

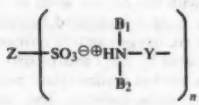
LACTAM DERIVED SALTS OF SULFONIC ACIDS AS LATENT ACID CATALYSTS

Rostyslaw Dowbenko, Gibsonia, and Barbara A. Greigger, Allison Park, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

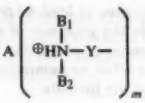
Filed Mar. 28, 1983, Ser. No. 479,604
Int. Cl.[4] C08F *4/22*
U.S. Cl. 525—31 **24 Claims**

1. In a curable composition which is capable of acid catalyzed crosslinking, comprising an active hydrogen-containing resin, a crosslinking agent present externally and/or internally as a part of the active hydrogen containing resin, and an acid catalyst, wherein the improvement in curing comprises using as the acid catalyst a catalytic amount of a latent acid catalyst represented by either of the following structural formulas:

(I)

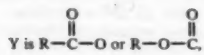


(II)



wherein:

Z is a C_1 to C_{12} alkyl radical, a C_5 to C_{12} cycloalkyl radical, or a C_6 to C_{28} aromatic radical; B_1 and B_2 are independently hydrogen, a C_1 to C_{18} alkyl radical, a C_5 to C_{12} cycloalkyl radical, or a C_6 to C_{10} aromatic radical;



wherein

R is a C_2 to C_{12} alkylene radical, or a C_8 to C_{16} arylene radical;

A is SO_4^{-2}, HSO_4^-, PO_4^{-3}, HPO_4^{-2}, or $H_2PO_4^-$;

n is an integer from 1 to 3; and

m is an integer from 1 to 3.

4,550,138

POLYCARBONATE COMPOSITIONS WITH IMPROVED LOW TEMPERATURE IMPACT STRENGTH

Charles F. Paddock, Southbury, and John M. Wefer, Newtown, both of Conn., assignors to Uniroyal, Inc., Middlebury, Conn.

Filed Apr. 23, 1984, Ser. No. 603,008
Int. Cl.[4] C08L *69/00*
U.S. Cl. 525—67 **9 Claims**

1. A blend comprising a mixture of

(A) 60–97% by weight of a polycarbonate resin and, correspondingly,

(B) 40–3% by weight of a graft copolymer of at least one monomer selected from alkenoic nitriles, esters, amides or acids, vinyl aromatic monomers, and maleic anhydride on an olefin elastomer selected from ethylene/propylene/diene terpolymer rubber and ethylene/propylene copolymer, said graft copolymer containing 30–80% olefin elastomer by weight.

4,550,139

MIXTURES OF POLYACRYLATE RESINS AND SILOXANE-STYRENE COPOLYMERS

Barry C. Arkles, Ambler, Pa., assignor to Petrarch Systems, Inc., Bristol, Pa.

Continuation-in-part of Ser. No. 360,525, Mar. 22, 1982, Pat. No. 4,478,981. This application Jan. 13, 1983, Ser. No. 457,558
Int. Cl.[4] C08L *33/08, 33/10, 53/00*
U.S. Cl. 525—90 **14 Claims**

1. An optically clear lens prepared from a compositions comprising an alloy of a polyacrylate resin and a siloxane-styrene copolymer, said alloy having an oxygen permeability greater than the polyacrylate resin.

4,550,140

CIRCUIT BOARD SUBSTRATES PREPARED FROM POLY(ARYL ETHERS)S

Stephen B. Rimsa, Lebanon; James E. Harris; Herbert S. Chao, both of Piscataway, and Louis M. Maresca, Belle Mead, all of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 20, 1984, Ser. No. 591,545
Int. Cl.[4] C08G *65/40*
U.S. Cl. 525—132 **18 Claims**

1. A circuit board substrate molded from a composition comprising a poly(aryl ether) containing recurring units of the following formula:

wherein E is the residuum of a dihydric phenol which contains repeating units derived from bis-(3,5-dimethyl-4-hydroxyphenyl)sulfone, E' is the residuum of a benzenoid compound, and wherein the poly(aryl ether) has a reduced viscosity of at least about 0.3 dl/g as measured in N-methylpyrrolidinone at a concentration of 0.2 g/100 ml at 25° C.

4,550,141

BLENDS OF IONOMER WITH PROPYLENE COPOLYMER

George L. Hoh, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 22, 1983, Ser. No. 525,505
Int. Cl.[4] C08L *23/16, 23/26, 23/08*
U.S. Cl. 525—221 **14 Claims**

1. A molecular blend of polymeric materials for producing film characterized by a nearly constant peel strength over an extended heat seal temperature range, said materials comprising:

(a) 80–93 weight percent of an ethylene/acid ionomer, and

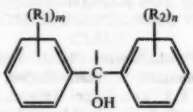
(b) 7–20 weight percent of a propylene/α-olefin copolymer, wherein the α-olefin comprises 1–12 weight percent of the copolymer.

4,550,142
RUBBER COMPOSITION

Shuichi Akita, Kamakura, and Toshio Namizuka, Yokohama, both of Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

Filed Apr. 26, 1983, Ser. No. 488,817
Claims priority, application Japan, Apr. 30, 1982, 57-72680
Int. Cl.⁴ C08F *8/30*
U.S. Cl. 525—236 **12 Claims**

1. A sulfur-vulcanizable rubber composition comprising 10 to 100% by weight of a highly unsaturated polymer rubber having a Mooney viscosity (ML_{1+4}, 100° C.) of 10 to 200, wherein at least 0.1 mol, per mol of the rubber molecular chain, of a benzophenone group represented by formula



wherein R_1 and R_2 represent amino, alkylamino or dialkylamino, and m and n represent intergers whose total is from 1 to 10, is bonded to a carbon atom in the rubber molecular chain, and 90 to 0% by weight of at least one rubber selected from diene rubbers, polyalkenamers and natural rubber.

4,550,143
COMPOSITION COMPRISING ETHYLENE-BASED POLYMERS

Kenji Tanaka; Akinobu Sugawara, and Takashi Yamawaki, all of Ichihara, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed Jun. 1, 1984, Ser. No. 616,601
Claims priority, application Japan, Jun. 10, 1983, 58-102856; Jun. 16, 1983, 58-106781
Int. Cl.⁴ C08L *23/06, 23/16, 23/20*
U.S. Cl. 525—240 **5 Claims**

1. A composition of polymers of ethylene comprising
(a) from 15 to 90% by weight of a homopolymer of ethylene comprising a combination of a first polyethylene having an intrinsic viscosity in the range from 11 to 26 dl/g and a second polyethylene having an intrinisic viscosity in the range 0.2 to 1.6 dl/g in a weight ratio in the range from 1:1 to 1:10, and
(b) from 85 to 10% by weight of a copolymer of ethylene and an α-olefin having from 3 to 10 carbon atoms in a molecule,
said resin composition having an intrinsic viscosity in the range from 2.0 to 5.2 dl/g, a density in the range from 0.938 to 0.970 g/cm³ and a swelling ratio of at least 1.30 and satisfying the relationships expressed by the equations $\log MI \geqq 0.81 - 0.69\,[\eta]$ and $\log MT \geqq 1 - 0.33 \log MI$, in which MI is a melt index, $[\eta]$ is an intrinsic viscosity and MT is a melt tension.

4,550,144
PROPYLENE-ETHYLENE COPOLYMERS FOR HIGH-RIGIDITY MOLDED PRODUCTS AND PROCESS FOR PRODUCING THE SAME

Hiromasa Chiba; Katsumi Kumahara; Takakiyo Harada; Takahiro Oka, and Akihiro Sato, all of Chibaken, Japan, assignors to Chisso Corporation, Osaka, Japan

Filed May 18, 1983, Ser. No. 495,654
Claims priority, application Japan, May 19, 1982, 57-84446
Int. Cl.⁴ C08F *297/08*
U.S. Cl. 525—247 **10 Claims**

1. A propylene-ethylene block copolymer for high-rigidity molded products, obtained by
(i) polymerizing propylene in an amount of 70 to 95% by weight based on the total polymerized amount,
in the presence of a catalyst obtained by reacting an organoaluminum compound (I) or a reaction product of an organoaluminum compound (I) with an electron donor (A), with $TiCl_4$(C),
further reacting the resulting solid product (II) with an electron donor (A) and an electron acceptor (B), and
combining the resulting solid product (III) with an organoaluminum compound (IV) and an aromatic carboxylic acid ester (V), the aromatic carboxylic acid ester (V) and the organoaluminum compound (IV) having not been previously reacted together prior to being combined with solid product (III),
the molar ratio of said aromatic carboxylic acid ester (V) to said solid product (III) being in the range of 0.1 to 10.0, and then
(ii) polymerizing ethylene or ethylene and propylene in an amount of 30 to 5% by weight based on the total polymerized amount, at one or more stages, in the presence of the same catalyst, as above,
the ethylene content being in the range of 3 to 20% by weight based on the total polymerized amount.

4,550,145
PROCESS FOR THE PRODUCTION OF PROPYLENE BLOCK COPOLYMERS BY A THREE STEP METHOD

Toshikazu Kasahara, and Tsutomu Nishikawa, both of Ichihara, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed Dec. 8, 1983, Ser. No. 559,381
Claims priority, application Japan, Dec. 27, 1982, 57-226549
Int. Cl.⁴ C08F *297/08*
U.S. Cl. 525—267 **11 Claims**

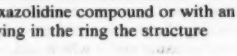
1. A process for producing a propylene block copolymer by a three-step reaction in the presence of a stereo-regular catalyst, which comprises:
(1) polymerizing propylene at a temperature of 55° C. or more to form polypropylene having an intrinsic viscosity of from 0.5 to 3.5 in an amount of from 50 to 94% by weight based on the total amount of the final propylene block copolymer formed during this three-step reaction;
(2) polymerizing propylene at a temperature of from 30° to 90° C. to form polypropylene in an amount of from 25 to 3% by weight based on the total amount of the final propylene block copolymer formed during this three-step reaction, the polypropylene formed during this second step having an intrinsic viscosity of at least 4; and
(3) copolymerizing ethylene and propylene at a temperature of from 30° to 90° C. to form an ethylene-propylene copolymer in an amount of from 25 to 3% by weight based on the total amount of the final propylene block copolymer formed during this three-step reaction, the ethylene-propylene copolymer formed during this third step having an intrinsic viscosity of at least 3.

4,550,146
PAINT BINDERS CARRYING OXAZOLIDINE GROUPS AND PROCESS FOR PRODUCING SUCH BINDERS

Willibald Paar, and Helmut Hönig, both of Graz, Austria, assignors to Vianova Kunstharz, A.G., Werndorf, Austria

Filed Dec. 19, 1984, Ser. No. 683,361
Claims priority, application Austria, Dec. 19, 1983, 4408/83
Int. Cl.⁴ C08G *59/14*
U.S. Cl. 525—327.3 **14 Claims**

1. Process for producing cationic epoxy resins carrying oxazolidine groups suitable as paint binders characterized in that the epoxy resin is reacted at from about 65°-90° C. with a hydroxy functional oxazolidine compound or with an oxazolidine compound carrying in the ring the structure



wherein R is H or an alkyl or aryl radical and is free of alcoholic hydroxy groups in the presence of a monocarboxy compound, the weight ratio between the oxazolidine compound and monocarboxy compound being between about 1:5 and 2:1, the mole-sum of the epoxy reactive groups substantially corresponding to the mole-sum of the epoxy groups of the epoxy resin, and at least 30% of the basic components having an oxazolidine structure with an amine number of at least 35 mg KOH/g.

4,550,147

RUBBER COMPOSITION WITH TRITHIOL TRIAZINE AND COBALT SALT

Riichiro Oohara, Suita, Japan, assignor to The Toyo Rubber Industry Co., Ltd., Osaka, Japan

Continuation of Ser. No. 356,639, Mar. 10, 1932, abandoned. This application Sep. 10, 1984, Ser. No. 649,162

Int. Cl.⁴ C08F *19/20*

U.S. Cl. 525—332.6 **2 Claims**

1. A rubber composition including adhesive components of 0.5 to 5 parts by weight of cobalt salt and 0.1 to 5 parts by weight of 1,3,5-triazine-24,6-trithiol as to 100 parts by weight of rubber.

4,550,148

MOLDING COMPOSITIONS BASED ON HIGH MOLECULAR WEIGHT POLYALKYLENE TEREPHTHALATES

Michael Droescher, Dorsten; Klaus Burzin, Marl; Christian Gerth, and Horst Heuer, both of Haltern, all of Fed. Rep. of Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jan. 16, 1985, Ser. No. 691,826

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1984, 3401345

Int. Cl.⁴ C08G *63/76;* **C08L** *67/02*

U.S. Cl. 525—440 **5 Claims**

1. A molding composition based on a high-molecular polyalkylene terephthalate having a viscosity number J of >80 cm^3/g, prepared by heating at 240°–300° C. a molten mixture of

(A) polyalkylene terephthalate having a viscosity number J of at least 50 cm^3/g, and

(B) 0.05–2.5 parts by weight, based on 100 parts by weight of the molding composition, of a cyclic, trimerized isophorone diisocyanate or an oligomer thereof with a degree of oligomerization of 2–5 with an isocyanate functionality of 3–7.

2. A molding composition according to claim 1, wherein the diisocyanate is cyclic, trimerized isophorone diisocyanate.

4,550,149

PROCESS FOR PRODUCING STYRENIC/ALKENYLNITRILE COPOLYMERS

Jeffrey D. Morris, and Robert A. Fuller, both of Big Spring, Tex., assignors to Cosden Technology, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 422,767, Sep. 24, 1982, abandoned. This application Aug. 17, 1984, Ser. No. 642,291

Int. Cl.⁴ C08F *212/10*

U.S. Cl. 526—68 **20 Claims**

1. A process for the continuous polymerization of styrenic and alkenylnitrile monomers to produce a styrenic/alkenylnitrile copolymer, comprising the steps of:

(a) continuously introducing a feed comprising a predetermined ratio of styrenic and alkenylnitrile monomers into a reaction vessel to produce a reaction mixture;

(b) subjecting the reaction mixture to conditions of temperature and pressure under which said monomers copolymerize to produce a fluid containing styrenic/alkenylnitrile copolymer, styrenic monomer, and alkenylnitrile monomer;

(c) continuously withdrawing at least a part of the produced fluid from the reaction vessel and introducing the withdrawn fluid into a two stage devolatilizer;

(d) in the first stage, adjusting the ratio of styrenic to alkenylnitrile monomer in the withdrawn fluid to a ratio which is selected to provide, upon polymerization, a styrenic/alkenylnitrile copolymer having approximately the same ratio of styrenic:alkenylnitrile monomer units as the styrenic/alkenylnitrile copolymer withdrawn from the reaction vessel; and

(e) in the second stage, heating the withdrawn fluid to a temperature sufficient to volatilize substantially all of the volatile components therein and separating the volatilized components from non-volatilized components.

4,550,150

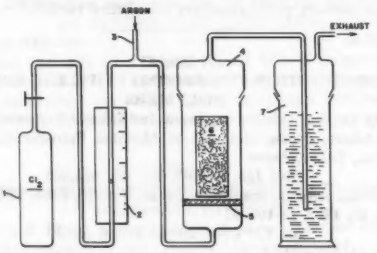
COLORATION OF ACETYLENIC MONOMERS BY GASES

Gordhanbhai N. Patel, Morris Plains; Anthony F. Preziosi, Ledgewood; Himangshu R. Bhattacharjee, Parsippany, all of N.J., and Lester T. C. Lee, Taipei, Taiwan, assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Nov. 19, 1980, Ser. No. 208,227

Int. Cl.⁴ C08F *2/00, 4/00;* **C09K** *3/00*

U.S. Cl. 526—233 **7 Claims**



1. A process for producing coloration in a composition comprising at least one substituted acetylenic monomer wherein said monomer contains:

i. at least two conjugated triple bonds, and

ii. at least one substituent containing at least one oxygen or nitrogen atom;

wherein said process comprises exposing said monomer in the crystalline state to at least one gas selected from the group consisting of chlorine, bromine, iodine, nitrosyl chloride, nitrogen dioxide, nitric oxide, cyanogen chloride, phosphorous trifluoride and ozone; whereby said gas undergoes an addition reaction with said conjugated triple bond.

4,550,151

ORGANOBOROSILICON POLYMER AND A METHOD FOR THE PREPARATION THEREOF

Minoru Takamizawa; Taishi Kobayashi; Akira Hayashida, and Yoshihumi Takeda, all of Niigata, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 5, 1984, Ser. No. 678,221

Claims priority, application Japan, Dec. 5, 1983, 58-230346

Int. Cl.⁴ C08G *79/08*

U.S. Cl. 528—7 **4 Claims**

1. An organoborosilicon polymer comprising a first type of the recurring monomeric units represented by the general formula $—SiR^1{}_2—CH_2—$, in which R^1 is a hydrogen atom or a monovalent hydrocarbon group selected from the class consisting of methyl, ethyl, vinyl and phenyl groups, and a second type of the recurring monomeric units represented by the general formula $—BR^2—NR^3—$, in which R^2 is a group selected from the class consisting of monovalent hydrocarbon groups, trihydrocarbylsilyl-substituted alkyl groups repre-

sented by the general formula $—CH_2)SiR^4_3$, R_4 being a monovalent hydrocarbon group and n being a positive integer, and substituted or unsubstituted amino groups represented by the general formula $—NR^5_2$, R^5 being a hydrogen atom or a monovalent hydrocarbon group, and R^3 is a monovalent hydrocarbon group.

4,550,152

NICKEL COMPLEX CATALYST FOR HYDROSILATION REACTIONS

Robert A. Faltynek, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Division of Ser. No. 546,640, Oct. 28, 1984, , which is a continuation-in-part of Ser. No. 330,172, Dec. 14, 1981, abandoned. This application Aug. 3, 1984, Ser. No. 637,468

Int. Cl.⁴ C08G *77/06*

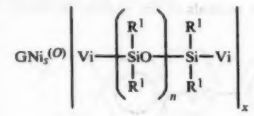
U.S. Cl. 528—15 **37 Claims**

1. A curable composition, comprising:

(a) 100 parts by weight of a polymer containing olefinic groups,

(b) 1 to 50 parts by weight of a hydride-containing crosslinking agent, and

(c) 10 to 500 parts per million of a zero valent nickel complex catalyst as nickel, having the formula



where G is selected from monodentate and bidentate phosphorous groups having hydrogen atoms, substituted or unsubstituted hydrocarbon radicals or mixtures thereof bonded to the phosphorous atoms of said phosphorous groups, s is a whole number that varies from 1 to 3, x is a whole number that varies from 1 to 3, n is a positive integer, Vi is vinyl and R^1 is a C_{1-8} monovalent hydrocarbon radical.

4,550,153

ELASTOMER BASED ON CRUDE DIPHENYLMETHANE DIISOCYANATE AND ANILINE IN THE RIM PROCESS

Thomas G. Carver, Summit, N.J., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Oct. 26, 1984, Ser. No. 665,187

Int. Cl.⁴ C08G *18/30, 18/16*

U.S. Cl. 528—49 **12 Claims**

1. A dimensionally stable reaction injection molded polyurethane elastomer comprising the reaction product of crude diphenylmethane diisocyanate, a polyoxyalkylene polyether polyol or mixture thereof and a chain extender wherein said elastomer contains an effective amount of aniline for improving the tensile strength, tear strength, and room temperature tangential modulus.

4,550,154

THERMOSETTING COATING COMPOSITION

Panagiotis I. Kordomenos, Mt. Clemens, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 27, 1983, Ser. No. 565,320

Int. Cl.⁴ C08G *8/32, 59/00;* **C08L** *61/26, 63/02*

U.S. Cl. 528—73 **25 Claims**

1. An organic solvent based thermosetting composition comprising:

(A) crosslinkable hydroxy functional epoxy ester resin having a number average molecular weight (Mn) between about 1,000 and about 5,000, said resin comprising the reaction product of diepoxide reactant (i) in chain extension reaction substantially simultaneously with dicarboxylic acid and diphenol, and (ii) in chain termination reaction with acid component comprising hydroxy functional acid; and

(B) polyfunctional, hydroxy-reactive crosslinking agent selected from aminoplast crosslinking agent, blocked polyisocyanate crosslinking agent comprising at least two isocyanate groups blocked by reaction with an active hydrogen bearing blocking agent, and a compatible mixture of any of them, said crosslinking agent being included in an amount such that at the cure temperature of the composition said crosslinking agent will provide between about 0.5 and about 1.6 hydroxy reactive groups per hydroxy group contributed by said epoxy ester resin.

4,550,155

PREPARATION OF BRANCHED POLYCARBONATES BY TRANSESTERIFICATION WITH A TRIARYL TRICARBOXYLIC ACID BRANCHING AGENT

James F. Jones, Windsor, and John B. Starr, Jr., Pittsfield, both of Mass., assignors to General Electric Co., Pittsfield, Mass.

Filed Nov. 3, 1983, Ser. No. 548,419

Int. Cl.⁴ C08G *63/62, 63/64*

U.S. Cl. 528—176 **7 Claims**

1. A method of making a high molecular weight, thermoplastic randomly branched polycarbonate having an intrinsic viscosity of 0.30 to 1.0 which comprises polymerizing an aromatic dihydric phenol by transesterification with a diaryl carbonate in the presence of from about 0.01 to about 1.0 mole percent, based on the moles of the aromatic dihydric phenol, of a branching agent consisting solely of a triaryl ester of a trifunctional carboxylic acid.

4,550,156

POLYETHERIMIDE COPOLYMERS

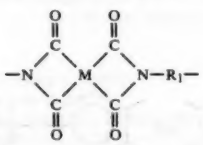
Patrick E. Gallagher, Pittsfield, Mass., assignor to General Electric Company, Pittsfield, Mass.

Filed Oct. 26, 1984, Ser. No. 665,048

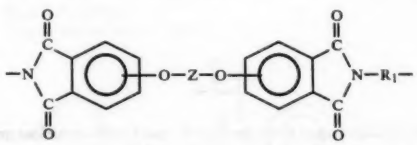
Int. Cl.⁴ C08G *73/10*

U.S. Cl. 528—185 **6 Claims**

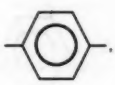
1. A polyetherimide copolymer which comprises repeating polyimide units of the formula



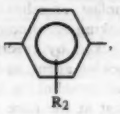
and repeating polyetherimide units of the formula



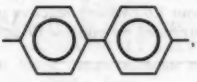
wherein R_1 is selected from the group represented by the following formulas:



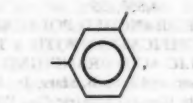
-continued



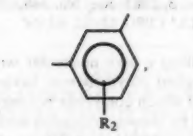
II



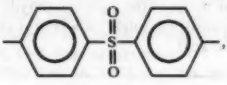
III



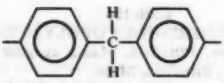
IV



V

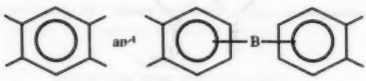


VI

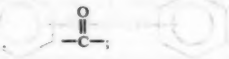


VII

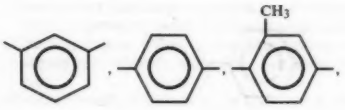
where R_2 is an alkyl radical of from 1 to 4 carbon atoms, provided that from about 1% to about 90% of the groups in the copolymer represented by R_1 are selected from formulas I–III and from about 99% to about 1% of those groups are selected from the formulas IV–VII; M is selected from the group consisting of



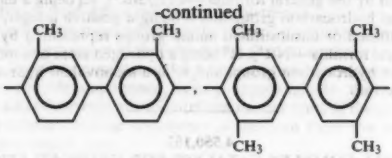
wherein B is —S— or

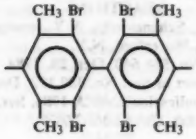


—O—Z—O— may be in the 3 or 3'- and 4 or 4'- positions and Z is a member of the class consisting of (1)

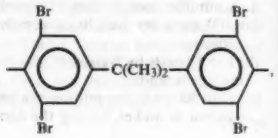


-continued

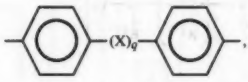




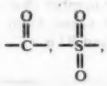
and



and (2) divalent organic radicals of the general formula:



where X is a member selected from the class consisting of divalent radicals of the formulas, $-C_yH_{2y}-$,



—O— and —S—, where q is 0 or 1, y is a whole number from 1 to 5, and wherein the copolymer contains from about 10 to about 10,000 of the polyimide and polyetherimide repeating groups.

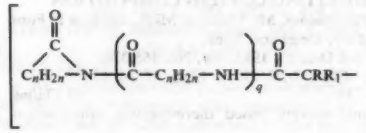
4,550,157

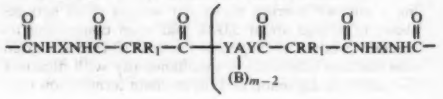
POLYAMIDE BLOCK COPOLYMER FROM LACTAM AND AZETIDINE-2,4-DIONE

Shenghong A. Dai, Wallingford; Steven J. Grossman, Cheshire, and Kemal Onder, North Haven, all of Conn., assignors to The Dow Chemical Company, Midland, Mich.

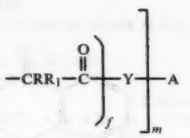
Filed May 7, 1984, Ser. No. 608,004
Int. Cl.[4] C08G *69/14, 73/10*
U.S. Cl. 528—322 **15 Claims**

1. A polyamide block copolymer having the formula

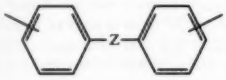




-continued



wherein A is the residue after active hydrogen removal of a polymeric polyol or polyamine having a molecular weight of from about 400 to about 8000 and a functionality m of from about 2 to about 6, Y represents —O— when said A is the residue of a polymeric polyol and —NH— when said A is the residue of a polymeric polyamide, f has an average value between 0 and 1, B represents a branch unit when the functionality of said polymeric polyol or polyamide is greater than 2, R and R_1 when taken separately are independently selected from the group consisting of hydrogen and hydrocarbyl, and when R and R_1 are taken together with the carbon atom to which thay are joined represent a cycloalkane having 4 to 8 ring carbon atoms, inclusive, X is selected from the group consisting of lower alkyene, cycloalkylene, arylene, and divalent radicals having the formula



wherein Z is selected from the group consisting of —CO—, —O—, —SO_2—, and alkylene having 1 to 4 carbon atoms, inclusive, C_nH_{2n} represents an alkylene radical of 3 to 12 carbon atoms, inclusive, present in a polyamide recurring unit wherein q has a mean value of at least about 2 and the weight percent proportion of said polyamide block is from about 25 percent to about 90 percent of said copolymer.

4,550,158

METAL-FREE DISAZO COMPOUNDS CONTAINING AT LEAST TWO BASIC WATER-SOLUBILIZING GROUPS AND HAVING A 1-PHENYLPYRAZOLE MIDDLE COMPONENT RADICAL AND A 6-HYDROXYPRID-2-ONE TERMINAL COUPLING COMPONENT

Paul Doswald, Münchenstein; Emil Moriconi, Basel; Helmut Moser, Oberwil, and Horst Schmid, Reinach, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

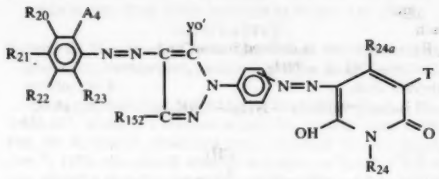
Division of Ser. No. 402,407, Jul. 27, 1982, , which is a continuation-in-part of Ser. No. 261,318, May 7, 1981, abandoned, and a continuation-in-part of Ser. No. 391,261, Jun. 23, 1982, abandoned, said Ser. No. 391,261, is a continuation-in-part of Ser. No. 261,318, . This application Aug. 18, 1982, Ser. No. 409,170

Claims priority, application Switzerland, May 8, 1980, 3601/80; May 8, 1980, 3602/80; May 8, 1980, 3603/80; May 8, 1980, 3604/80; May 8, 1980, 3605/80; May 8, 1980, 3606/80; May 13, 1980, 3735/80; May 13, 1980, 3736/80; May 13, 1980, 3737/80; May 29, 1980, 4183/80; May 29, 1980, 4184/80; May 29, 1980, 4185/80; Jul. 1, 1980, 5079/80; Jul. 1, 1980, 5080/80; Jul. 1, 1980, 5081/80; Dec. 10, 1980, 9104/80; Dec. 10, 1980, 9105/80; Dec. 10, 1980, 9106/80

Int. Cl.[4] C09B *44/02, 44/08, 44/18, 44/20*

U.S. Cl. 534—605 **19 Claims**

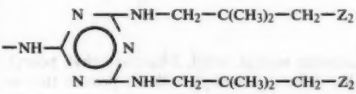
1. A compound of the formula



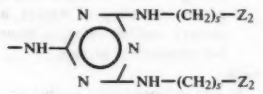
wherein A_4 is —OH, —NH_2, —COOH, C_{1-4}alkoxy or hydrogen,

R_{20} is hydrogen or nitro,

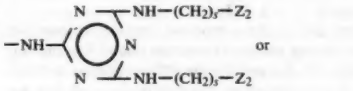
R_{21} is hydrogen, nitro, —NH—CO—$(CH_2)_2$—Z_2, —CH-$_2$—Z_2, —SO_2—NH—$(CH_2)_s$—Z_2, —SO_2NH_2, —CO—CH_2—Z_2, —CO—NH—$(CH_2)_2$—Z_2,



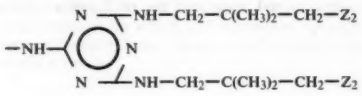
or



R_{22} is hydrogen, nitro, —SO_2NH_2, —$SO_2N(R_{22a})_2$, —SO-$_2$—NH—$(CH_2)_s$—OH, —CH_2—Z_2, —SO_2—NH—$(CH_2$-$)_s$—Z_2, —CO—NH—$(CH_2)_s$—Z_2, —NH—CO—$(CH_2$-$)_s$—Z_2,



or



wherein each

R_{22a} is independently C_{1-4}alkyl,

R_{23} is hydrogen or methyl,

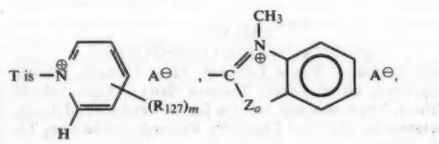
R_{24} is hydrogen, C_{1-4}alkyl, 2-hydroxyethyl, —$(CH_2)_p$—Z_2, benzyl, —$N(R_{30})_2$, —$(CH_2)_3$—OCH_3, —CH_2—CH(CH-$_3$)—$N(R_{30})_2$ or —CH_2—$C(CH_3)_2$—CH_2—$N(R_{30})_2$,

wherein each

R_{30} is independently hydrogen or C_{1-4}alkyl,

R_{24a} is C_{1-4}alkyl,

R_{152} is methyl or carboxy,



—CO—NH_2, —NH_2, —$N(CH_3)_2$, —$\overset{\oplus}{N}(CH_3)_3$ $A^{\ominus}$ or —CN,

wherein

Z_o is —S—, —O— or —NR_{35}'—,

wherein

R_{35}' is hydrogen, C_{1-4}alkyl or (C_{1-4}-alkoxy)carbonylmethyl, and

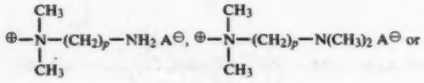
each

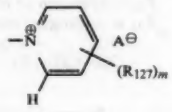
R_{127} and m are as defined below, and

yo' is —OH or —NH_2,

wherein each

Z_2 is independently —NH_2, —$N(R_o)_2$, —$N^{\oplus}(R_o)_3A^{\ominus}$,





wherein each

R_o is independently methyl, ethyl, 2-hydroxyethyl, benzyl, acetylmethyl or benzoylmethyl, with the proviso that no nitrogen atom contains more than one member of the group consisting of benzyl, acetylmethyl and benzoylmethyl, and no nitrogen atom contains more than two 2-hydroxyethyl groups,

each

R_{127} is independently methyl or ethyl, and

m is 0, 1 or 2,

each

$A^{\ominus}$ is independently a non-chromophoric anion,

each

p is independently 1, 2 or 3, and

each

s is independently 1, 2, 3, 4, 5 or 6,

with the provisos that (i) the compound contains at least two basic water-solubilizing groups, (ii) at least one of R_{20} and R_{21} is other than nitro, (iii) R_{21} and R_{22} are different unless both are hydrogen, (iv) R_{20} is hydrogen when both R_{21} and R_{22} are hydrogen, and (v) at least one of R_{20}–R_{23} is hydrogen.

4,550,159

ANTHRACYCLINE COMPOUNDS

Hamao Umezawa; Tomio Takeuchi; Masa Hamada; Hiroshi Naganawa, all of Tokyo; Tsutomu Sawa, Ayase; Takeshi Uchida, Yokohama, and Masaya Imoto, Urawa, all of Japan, assignors to Microbial Chemistry Research Foundation, Tokyo, Japan

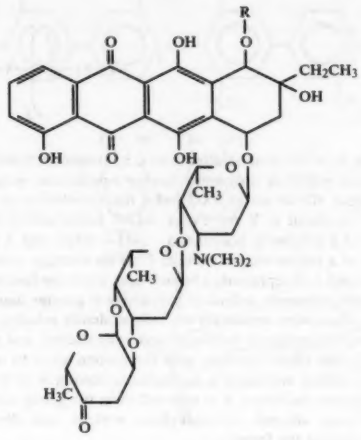
Filed Oct. 25, 1983, Ser. No. 545,137

Claims priority, application Japan, Nov. 2, 1982, 57-192727

Int. Cl.[4] **A61K** *31/71;* **C07H** *15/24;* **C12P** *19/56*

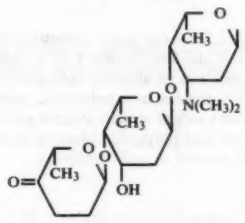
U.S. Cl. 536—6.4 **4 Claims**

1. An anthracycline compound, ditrisarubicin, of the following formula:

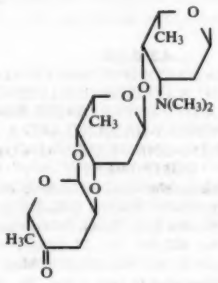


wherein R represents one of the following substituents (A) to (C):

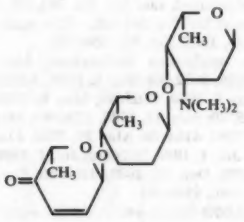
(A)



(B)



(C)



or an acid addition salt of the ditrisarubicin.

4,550,160

PROCESSES FOR THE INTERCONVERSION OF C-076 COMPOUNDS

Helmut H. Mrozik, Matawan, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 13, 1979, Ser. No. 66,255
Int. Cl.[4] C07H *17/08*
U.S. Cl. 536—7.1 6 Claims

1. A process for converting C-076 A2a/A2b or C-076 B2a/B2b compounds into 22,23-dihydro C-076 B1a/B1b compounds respectively, which comprises reacting a C-076 A2a-/A2b or C-076 B2a/B2b compound suitably protected at any hydroxy groups at the 4'' and 5 positions and unprotected at the 23 position hydroxy, with a substituted thiocarbonylhalide having the formula:

wherein Hal is a halogen selected from fluorine, chlorine, bromine or iodine, and R_4 is substituted phenoxy wherein the substituents are lower alkyl or disubstituted amino wherein the reaction is carried out at room temperature in an aprotic solvent and in the presence of a tertiary amine, to produce the 23-0 substituted thiocarbonyl compound, which is treated with tributyl tin hydride in an aprotic solvent in the presence of a free radical initiator selected from azobisisobutyronitrile, heat or ultraviolet light at from 80° to 110° C., to prepare the 22,23-dihydro compound; and said 22,23-dihydro C-076 A1a/A1b and 22,23-dihydro C-076 B1a/B1b compounds are prepared by removing any such protecting groups.

4,550,161

PREPARING WATER-SOLUBLE MIXED CELLULOSE ETHERS

Utz-Hellmuth Felcht, Bad Soden, and Gerhard Buchberger, Wiesbaden-Auringen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 443,104, Nov. 19, 1982, Pat. No. 4,460,766. This application Apr. 27, 1984, Ser. No. 605,192
Claims priority, application Fed. Rep. of Germany, May 3, 1983, 3316124
Int. Cl.[4] C08B *11/193*
U.S. Cl. 536—90 15 Claims

1. A process for preparing a water-soluble mixed cellulose ether which comprises the following steps:

(a) alkalizing cellulose in a reaction medium containing water and base to produce an alkali cellulose,

(b) etherifying the resulting alkali cellulose, in a reaction medium containing water and base, with at least one etherifying agent which requires a catalytic and sub-stoichiometric quantity of base for reaction with cellulose,

(c) increasing the quantity of base,

(d) further etherifying the cellulose ether, obtained from step (b) and combined with additional base in step (c), in a water-containing reaction medium with at least one etherifying agent which requires, for reaction with cellulose:

(i) an at least stoichiometric quantity of base or

(ii) a catalytic and sub-stoichiometric quantity of base which is in excess of that used in step (a);

at least one organic solvent selected from the group consisting of dimethoxyethane, alkanol, alkanediol and alkoxyalkanol being a dispersing auxiliary in at least one of steps (a), (b) and (d).

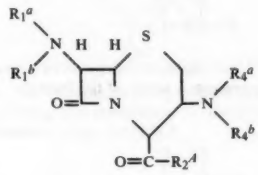
4,550,162

PROCESS FOR THE MANUFACTURE OF ENOL DERIVATIVES

Robert E. Woodward, Cambridge, Mass., and Hans Bickel, Binningen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 323,147, Nov. 19, 1981, Pat. No. 4,434,287, which is a division of Ser. No. 36,483, May 7, 1979, Pat. No. 4,319,027, which is a continuation of Ser. No. 913,429, Jun. 7, 1978, abandoned, which is a division of Ser. No. 671,193, Feb. 10, 1976, Pat. No. 4,110,533. This application Sep. 30, 1982, Ser. No. 430,071
The portion of the term of this patent subsequent to Aug. 29, 1995, has been disclaimed.
Int. Cl.[4] C07D *501/02;* A61K *31/545;* C07D *501/38*
U.S. Cl. 544—016 14 Claims

1. Process for the manufacture of a compound of the formula



(III)

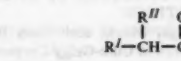
wherein $R_1{}^a$ represents an acyl group of the formula

(A_1)

wherein R^I represents hydrogen, cyclopentyl, cyclohexyl or cycloheptyl, or such cycloalkyl which is substituted in the 1-position by amino, protected amino, sulphoamino or sulphoamino in the form of an alkali metal salt, or R^I represents phenyl, naphthyl or tetrahydronaphthyl, or phenyl, naphthyl or tetrahydronaphthyl substituted by hydroxyl, protected hydroxyl, and/or by halogen, or R^I represents 4-isoxazolyl, or R^I represents an amino group which is N-substituted by lower alkyl or halogen substituted lower alkyl, or $R_1{}^a$ represents an acyl group of the formula

(A_2)

wherein R^I represents lower alkyl, halogeno-lower alkyl, phenyloxy-lower alkyl, hydroxyphenyloxy-lower alkyl, protected hydroxyphenyloxy-lower alkyl, halogeno-phenyloxy-lower alkyl, or lower alkyl substituted by amino and/or carboxyl, wherein amino is free or protected and carboxyl is free or protected, or R^I represents lower alkenyl, phenyl, hydroxyphenyl, protected hydroxyphenyl, halogeno-phenyl, hydroxyhalogeno-phenyl, protected hydroxy-halogeno-phenyl, amino-lower alkyl-phenyl, protected amino-lower alkyl-phenyl, phenyloxyphenyl, or R^I represents pyridyl, pyridinium, thienyl, furyl, imidazolyl or tetrazolyl, or these heterocyclic groups substituted by lower alkyl, amino, protected amino, aminomethyl or protected aminomethyl, or R^I represents lower alkoxy, phenyloxy, hydroxy-phenyloxy, protected hydroxyphenyloxy, halogeno-phenyloxy, lower alkylthio, lower alkenylthio, phenylthio, pyridylthio, 2-imidazolylthio, 1,2,4-triazol-3-ylthio, 1,3,4-triazol-2-ylthio, 1,2,4-thiadiazol-3-ylthio, 1,3,4-thiadiazol-2-ylthio, or 5-tetrazolylthio, and these heterocyclylthio groups, substituted by lower alkyl, or R^I represents halogeno, lower alkoxycarbonyl, cyano, carbamoyl, N-lower alkyl-carbamoyl, N-phenylcarbamoyl, lower alkanoyl, benzoyl, or azido, or $R_1{}^a$ represents an acyl group of the formula



(A3)

wherein R^I represents lower alkyl, phenyl, hydroxyphenyl, protected hydroxyphenyl, halogeno-phenyl, hydroxy-halogenophenyl, protected hydroxy-halogeno-phenyl, furyl, thienyl, or isothiazolyl, and also represents 1,4-cyclohexadienyl, and R^{II} represents amino, protected amino, guanidinocarbonyl-amino, sulphoamino, sulphoamino in alkalimetal salt-form, azido, carboxyl, carboxyl in alkali-metal salt-form, protected carboxyl, cyano, sulpho, hydroxyl, protected hydroxyl, O-lower alkyl-phosphono, O,O'-di-lower alkylphosphono or halogeno, or $R_1{}^a$ represents a group of the formula

(A4)

wherein R^I and R^{II} each represent halogeno, or lower alkoxycarbonyl, cr $R_1{}^a$ represents a group of the formula

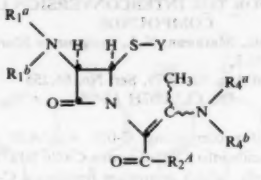
(A5)

wherein R^I represents phenyl, hydroxyphenyl, protected hydroxyphenyl, hydroxy-halogeno-phenyl, protected hydroxyhalogeno-phenyl, furyl, thienyl, isothiazolyl or 1,4-cyclohexadienyl, and R^{II} represents aminomethyl or protected aminomethyl or $R_1{}^a$ represents a group of the formula

(A6)

wherein each of the groups R^I, R^{II} and R^{III} represents lower alkyl, and $R_1{}^b$ represents hydrogen, or $R_1{}^a$ and $R_1{}^b$ together represent 1-oxo-3-aza-1,4-butylen, such group substituted in the 2-position by a group R^I as defined under formula (A_3) and such group substituted in the 4-position by lower alkyl, $R_2{}^A$ represents a group which together with the carbonyl grouping —C(=O)— forms a protected esterified carboxyl group, and the the group —N($R_4{}^a$)($R_4{}^b$) denotes a secondary amino group, wherein one of the substituents $R_4{}^a$ and $R_4{}^b$ represents hydrogen and the other represents lower alkyl, lower alkoxy-lower alkyl, lower alkyl-thio lower alkyl, cyclohexyl-lower alkyl, phenyl-lower alkyl, thienyl-lower alkyl, cycloalkyl with 3 to 7 carbon atoms, or such cycloalkyl substituted by lower alkyl, lower alkoxy, lower alkylthio, cyclohexyl, phenyl, or furyl, or wherein —N($R_4{}^a$)($R_4{}^b$) denotes a tertiary amino group, wherein each of the substituents $R_4{}^a$ and $R_4{}^b$, independent of each other is lower alkyl, lower alkoxy-lower alkyl, lower alkylthio-lower alkyl, cyclohexyl-lower alkyl, phenyl-lower alkyl, thienyl-lower alkyl, cycloalkyl with 3 to 7 carbon atoms, or such cycloalkyl substituted by lower alkyl, lower alkoxy, lower alkylthio, cyclohexyl, phenyl, or furyl, or wherein —N($R_4{}^a$)($R_4{}^b$) is 1-aziridinyl, 1-pyrrolidinyl, 1-piperidyl, 1H-2,3,4,5,6,7-hexahydroazepinyl, 4-morpholinyl, 4-thiomorpholinyl, 1-piperazinyl, or 4-methyl-1-piperazinyl and in which the double bond can be in the 2,3-position or the 3,4-position or a process giving a mixture of a compound having the double bond in the 2,3-position and a compound having the double bond in the 3,4-position,

characterised in that a compound of the formula



(II)

wherein $R_1{}^a$, $R_1{}^b$, $R_2{}^A$, $R_4{}^a$ and $R_4{}^b$ have the meanings mentioned under formula III, and Y represents a leaving group of the formula —S—R_4, wherein R_4 is a diazacyclyl, oxazacyclyl, thiazacylyl, thiadiazacyclyl, thiatriazacyclyl, oxadiazacyclyl, oxatriazacyclyl, benzdiazacyclyl, benzoxazacyclyl or benzthiazacyclyl radical of aromatic character which radical is bonded to the thio group —S— by one of its ring carbon atoms, which is bonded to a ring nitrogen atom by a double bond, or such group substituted by lower alkyl, lower alkoxy, halogen or phenyl, or wherein R_4 denotes lower alkanoyl, lower thioalkanoyl, cycloalkane carbonyl, cycloalkanethio carbonyl, benzoyl, thiobenzoyl, naphthylcarbonyl, naphthylthiocarbonyl, pyridylcarbonyl, thenoyl, furoyl, pyridylthiocarbonyl, thiothenoyl or thiofuroyl, or represents such an acyl or thioacyl group which is monosubstituted or polysubstituted by lower alkyl, halogen, lower alkoxy, phenyl or phenyloxy, which groups R_4 have up to 18 carbon atoms, or Y represents a leaving group of the formula —SO_2—R_5, wherein R_5 represents unsubstituted or lower alkoxy-, halogeno-, phenyl-, or phenyloxy-monosubstituted or -polysubstituted lower alkyl, lower alkenyl, cyclopentyl or cyclohexyl or R_5 represents naphthyl, or phenyl, or naphthyl or phenyl monosubstituted or polysubstituted by lower alkyl, lower alkoxy, halogen, phenyl, phenyloxy, or nitro, which groups R_5 have up to 18 carbon atoms, is heated in an inert solvent at a temperature of between 20° and 150°.

4,550,163

LIGAND ANALOG-IRREVERSIBLE ENZYME INHIBITOR CONJUGATES

Houston F. Voss; Jacob Plattner, both of Libertyville, and Thomas R. Herrin, Waukegan, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 9,007, Feb. 5, 1979, Pat. No. 4,273,866. This application Jan. 26, 1981, Ser. No. 228,414

Int. Cl.[4] **C07F** *9/60, 9/40*

U.S. Cl. 544—244 **25 Claims**

1. An analytical reagent for determining ligands in test samples comprising ligand analog-irreversible enzyme inhibitor conjugate.

4,550,164

PROCESS FOR PREPARING 2-METHYL-2-HYDROXYPROPYL PIPERAZINE-1-CARBOXYLATE COMPOUNDS

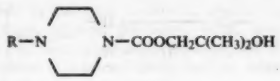
Irving M. Goldman, Niantic; Donald E. Kuhla, Ledyard, and Constantine Sklavounos, Waterford, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation of Ser. No. 81,226, Oct. 2, 1979, abandoned, which is a continuation-in-part of Ser. No. 907,082, May 18, 1978, abandoned. This application Apr. 24, 1981, Ser. No. 257,365

Int. Cl.[4] **C07D** *403/04*

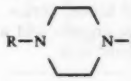
U.S. Cl. 544—291 **10 Claims**

1. A process for preparing a 2-methyl-2-hydroxypropyl-4-substituted piperazine-1-carboxylate compound of the structure



wherein R is selected from the group consisting of hydrogen, cyano, 4-amino-6,7,8-trimethoxyquinazolin-2-yl and 4-amino-6,7-dimethoxyquinazolin-2-yl, which comprises:

reacting a piperazine compound of the structure



with isobutylene carbonate in or without solvent until thermodynamic equilibrium is established, whereby the 2-methyl-2-hydroxypropyl carboxylate compound is produced essentially free of the corresponding 1,1-dimethyl-2-hydroxyethyl 4-substituted piperazine-1-carboxylate structural isomer,

provided that

when the piperazine compound and isobutylene carbonate are reacted without solvent, a neat melt is used covering temperatures from one at which the piperazine compound and isobutylene carbonate are in the liquid state to one at which the piperazine compound or isobutylene carbonate refluxes or decomposes,

when the piperazine compound and isobutylene carbonate are reacted in a polar, protic solvent the temperature is within the range of ambient to reflux, and

when the piperazine compound and isobutylene carbonate are reacted in a polar or nonpolar, aprotic solvent, the temperature is at least 70° C. to reflux.

4,550,165

PROCESS FOR PRODUCING 1,2,5,6-TETRAHYDRO-4H-PYRROLO-[3,2,1-IJ]-QUINOLIN-4-ONE

Pierre Martin, Rheinfelden, Switzerland, assignor to Ciba Geigy Corporation, Ardsley, N.Y.

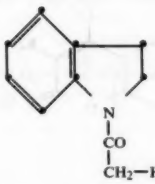
Filed Mar. 22, 1983, Ser. No. 477,706

Claims priority, application Switzerland, Mar. 25, 1982, 1839/82

Int. Cl.⁴ C07D *471/06*

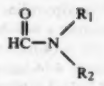
U.S. Cl. 546—94 **19 Claims**

1. A process for producing 1,2,5,6-tetrahydro-4H-pyrrolo[3,2,1-ij]-quinolin-4-one, which process comprises reacting a haloacetylindoline of the formula II



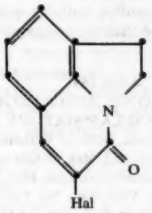
(II)

in which "Hal" is chlorine or bromine, with an addition product formed from an N,N-disubstituted formamide of the formula III



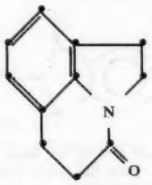
(III)

in which R_1 is C_1–C_4-alkyl or phenyl, and R_2 is C_1–C_4-alkyl, and an acid halide to give a 5-halo-1,2,3-(1,2-dihydropyrrolo)-4-quinolone of the formula IV



(VI)

in which "Hal" has the meaning defined in the foregoing; and then converting this compound, by catalytic hydrogenation, into 4-lilolidone of the formula I



(I)

4,550,166

(PYRIDINYL)-1,2,4-TRIAZOLO[4,3-A]PYRIDINES

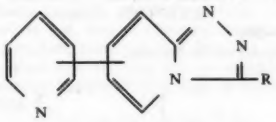
Daniel B. Moran, Suffern, N.Y.; Dennis W. Powell, Greenwich, Conn., and Jay D. Albright, Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 21, 1984, Ser. No. 612,188

Int. Cl.⁴ C07D *471/04*

U.S. Cl. 546—119 **13 Claims**

1. A compound selected from the group consisting of those of the formula:



wherein R is hydrogen or alkyl (C_1–C_3) and the pharmacologically acceptable acid-addition salts thereof.

4,550,167

PREPARATION OF 1-ALKYL-1,4-DIHYDRO-4-OXO-7-(4-PYRIDYL)-3-QUINOLINE CARBOXYLIC ACID

Venkataraman Ramachandran, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed May 23, 1983, Ser. No. 497,027

Int. Cl.⁴ C07D *215/16, 211/72, 211/70*

U.S. Cl. 546—156 **20 Claims**

1. In a process which comprises preparing a 1-alkyl-1,4-dihy-

dro-4-oxo-7-(4-pyridyl)-3-quinolinecarboxylic acid by (a) reacting a haloprene with a 4-vinylpyridine to form a 4-(halocyclohex-3-enyl)pyridine, including a 4-(4-halocyclohex-3-enyl)-pyridine, (b) aromatizing the 4-(4-halocyclohex-3-enyl)pyridine, (c) nitrating the resultant 4-(4-halophenyl)pyridine, (d) reducing the resultant 4-(4-halo-3-nitrophenyl)pyridine to a 4-(3-aminophenyl)pyridine, (e) converting the 4-(3-aminophenyl)pyridine to an alkyl 1-alkyl-1,4-dihydro-4-oxo-7-(4-pyridyl)-3-quinolinecarboxylate, and (f) hydrolyzing the product, the improvement which comprises facilitating the aromatization of the 4-(4-halocyclohex-3-enyl)pyridine by reacting the 4-(halocyclohex-3-enyl)pyridine with an acid to form a salt prior to reducing it to a 4-(halophenyl)pyridine.

4,550,168

BENZISOSELENAZOLONES AND A PROCESS FOR THE TREATMENT OF INFLAMMATORY DISEASES

André Welter; Sigurd Leyck, both of Pulheim, and Eugen Etschenberg, Cologne, all of Fed. Rep. of Germany, assignors to A. Nattermann & Cie GmbH, Cologne, Fed. Rep. of Germany

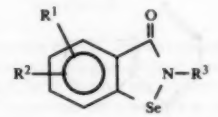
Filed Jul. 12, 1983, Ser. No. 513,094

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1982, 3226284

Int. Cl.⁴ C07D *417/06*; A61K *31/44, 31/425, 31/505*

U.S. Cl. 546—270 **11 Claims**

1. Benzisoselenazolones of the formula I



wherein R^1 and R^2 which can be the same or different from each other, are selected from the group consisting of hydrogen, halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, hydroxyl, trifluoromethyl, nitro, di-(C_1–C_4-alkyl)-amino and R^1 and R^2 together, methylenedioxy, and R^3 is a member selected from the group consisting of the heterocyclic group pyridyl, and such heterocyclic group substituted once or twice, identically or differently, by halogen, C_1–C_2-alkyl, C_1–C_4-alkoxy, hydroxyl, nitro, and carboxyl.

4,550,169

PLATINUM CHELATES OF 2-HYDRAZINO-AZOLES

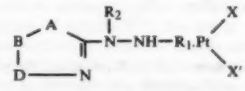
Joseph J. Hlavka, Tuxedo; Panayota Bitha, Pomona, and Yang-I Lin, Nanuet, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 21, 1983, Ser. No. 553,675

Int. Cl.⁴ C07F *15/00*

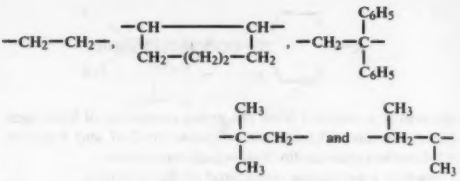
U.S. Cl. 548—108 **9 Claims**

1. A compound of the formula:



wherein R_1 is hydrogen, alkyl(C_1–C_6), trifluoroethyl or phenyl; R_2 is hydrogen or alkyl(C_1–C_6); A is a moiety of the formulae —S—, —O—, —CH_2— or

wherein R_3 is hydrogen or 1-methylethanol; —B—D— is a divalent moiety selected from the group consisting of those of the formulae:



and X and X′ are the same or different and are selected from the group consisting of halide, nitrate, nitrite, thiocyanate, sulfate and a monobasic organic acid and X and X′ taken together is a dibasic organic acid.

4,550,170

6-PHENYL-2,3,5,6-TETRAHYDROIMIDAZO-[2,1-b]-THIAZOLE DERIVATIVES

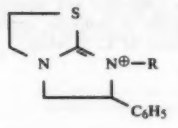
Eduard V. Gjulling; Larisa A. Djugovskaya; Dmitry I. Zabolotny; Jury P. Kovtun; Nikolai I. Liptuga; Viktor I. Litus; Marina B. Sambur; Nikolai N. Romanov; Alexei I. Tolmachev; Alexandr V. Kirsanov; Viktor N. Pisanko; Oleg F. Melnikov, and Evgeny I. Klochkov, all of Kiev, U.S.S.R., assignors to Institut Organicheskoi Khimii Akademii Nauk Ukrainskoi SSR and Kievsky Nauchno-Issledovatelsky Institut Otolaringologii, both of Kiev, U.S.S.R.

Filed Jan. 17, 1984, Ser. No. 571,465

Int. Cl.⁴ C07D *513/04*; A61K *31/425*

U.S. Cl. 548—154 **4 Claims**

1. 6-Phenyl-2,3,5,6-tetrahydroimidazo-[2,1-b]-thiazole derivatives of the general formula:



wherein R is CH_2COOCH_3, $CH_2COOC_{10}H_{21}$, CH_2CONH_2; X = Br.

4,550,171

2-(OXO, OR THIO)-3-SUBSTITUTED 1,3-BENZOTHIAZOLYL-4-CYANO-7-SUBSTITUTED AMINO-BENZOPYRANS

Peter Möckli, Basel, Switzerland, assignor to Ciba Geigy Corporation, Ardsley, N.Y.

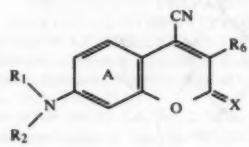
Filed Oct. 10, 1978, Ser. No. 949,939

Claims priority, application Luxembourg, Oct. 13, 1977, 78311

Int. Cl.⁴ C07D *417/04*

U.S. Cl. 548—159 **8 Claims**

1. A compound of the formula



(I)

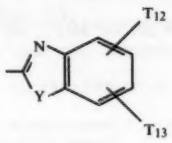
in which

R_1 and R_2 independently of one another are each hydrogen; alkyl of 1 to 7 carbon atoms unsubstituted or by hydroxyl, low-molecular alkoxy or carbalkoxy, phenoxy, cyano, carbonamido, halogen or acetoxy; cyclohexyl or methylcy-

clohexyl; benzyl, phenethyl, or β-phenyl-β-hydroxyethyl; unsubstituted phenyl or naphthyl or phenyl or naphthyl substituted by halogen, hydroxyl, cyano, rhodan, amino, phenylamino, phenyl, phenoxy, nitro, acetyl, acetoxy, acetylamino, benzoylamino or by alkyl, alkoxy, mono- and dialkyl amino or n-phenyl-n-alkylamino, wherein said alkyl residue is of 1-4 carbon atoms;

X is =NH or =O; and

R_6 is the radical



in which

Y is sulfur;

T_{12} is hydrogen, alkyl, halogen or alkoxy, and T_{13} is hydrogen or alkyl.

4,550,172

NOVEL HETEROCYCLIC COMPOUNDS AS ANTIALLERGIC AGENTS

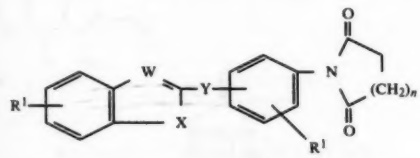
John H. Musser, Malvern, and Cesario O. Tio, Coatesville, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Sep. 21, 1984, Ser. No. 653,755

Int. Cl.⁴ C07D *277/64, 235/16*

U.S. Cl. 548—180 **3 Claims**

1. A compound having the formula

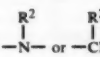


wherein

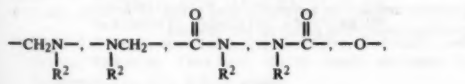
W is

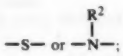
or —N—;

X is —O—, —S—,



Y is —CH_2O—, —OCH_2—, —CH_2S—, —SCH_2—,





n is 0-3;

R^1 is hydrogen, loweralkyl, loweralkoxy or halo;

R^2 is hydrogen or loweralkyl;

and the pharmaceutically acceptable salts thereof.

4,550,173

DITRIAZOLYLVINYL PHENYL KETONES

Alfred Ruland, Hirschberg; Wolfgang Reuther, Heidelberg; Ernst-Heinrich Pommer, Limburgerhof, and Eberhard Ammermann, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

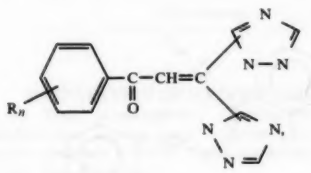
Filed Jan. 17, 1984, Ser. No. 571,454

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1983, 3302098

Int. Cl.⁴ A01N *43/64*; C07D *249/08*

U.S. Cl. 548—262 **5 Claims**

1. A ditriazolylvinyl phenyl ketone of the formula I



I

where R is halogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, trifluoromethyl, cyano, nitro, phenyl or phenoxy, and n is an integer from 0 to 5, and the two triazole rings are bonded in the 1-position or 4-position to the vinyl group.

4,550,174

PROCESS FOR REDUCING THE PROPORTIONS OF BY PRODUCTS IN THE PREPARATION OF CARBENDAZIM

Manfred Köch, Eppstein, and Thomas Maier, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

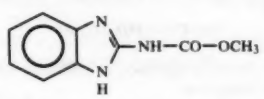
Filed Jun. 21, 1984, Ser. No. 622,839

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1983, 3323024

Int. Cl.⁴ C07D *235/32*

U.S. Cl. 548—306 **9 Claims**

1. A process for reducing the proportions of by-products in the synthesis of carbendazim of the formula



starting from o-phenylenediamine and methyl cyanocarbamate, in the presence of water and protonic acid, which comprises addition of a reducing agent to the reaction mixture.

4,550,175

PROCESS FOR THE STEREOSPECIFIC PREPARATION OF (Z)-1-(2,4-DICHLOROPHENYL)-2-(IMIDAZOL-1-YL)-O-(2,4-DICHLOROBENZYL)-ETHANONE OXIME ETHER

Georg Mixich, and Kurt Thiele, both of Zofingen, Switzerland, assignors to Siegfried Aktiengesellschaft, Zofingen, Switzerland

Continuation-in-part of Ser. No. 412,943, Aug. 30, 1982, Pat. No. 4,443,612, which is a continuation of Ser. No. 211,172, Nov. 28, 1980, abandoned, which is a continuation-in-part of Ser. No. 40,425, May 18, 1979, abandoned. This application Mar. 15, 1984, Ser. No. 589,938

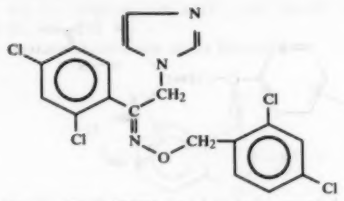
Claims priority, application Switzerland, May 24, 1978, 5653/78; Jan. 9, 1979, 161/79

The portion of the term of this patent subsequent to Apr. 17, 2001, has been disclaimed.

Int. Cl.[4] C07D *233/61*

U.S. Cl. 548—341 3 Claims

1. A process for preparing substantially pure (Z)-1-(2,4-dichlorophenyl)-2-(imidazol-1-yl)-O-(2,4-dichlorobenzyl)-ethanone oxime ether in its cis-isomer form and having the formula



(I)

or an acid addition salt thereof with a teleologically acceptable acid; which comprises:

(1) suspending substantially pure (Z)-1-(2,4-dichlorophenyl)-2-(imidazol-1-yl)-ethanone oxime in acetone,

(2) adding to the resulting suspension solid KOH in finely subdivided form with vigorous agitation in an amount that is about 5 to 15 mole % less than the equimolar amount of KOH relative to said oxime, and continuing the agitation until the oxime is dissolved,

(3) adding to the resulting solution an approximately equimolar amount of 2,4-dichlorobenzyl chloride and thereafter stirring the reaction mixture while maintaining it at a temperature not in excess of 40° C. until substantially complete reaction has been obtained, and

(4) pouring the reaction mixture into water or an aqueous solution of a teleologically acceptable acid and recovering the oxime ether product therefrom.

4,550,176

PREPARATION OF IMIDAZOLE-4,5-DICARBOXYLIC ACID

Toni Dockner, Meckenheim; Uwe Kempe, Dannstadt-Schauernheim, and Anton Frank, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 11, 1984, Ser. No. 569,965

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1983, 3301717

Int. Cl.[4] C07D *233/90*

U.S. Cl. 548—343 15 Claims

1. A process for the preparation of imidazole-4,5-dicarboxylic acid which comprises:

reacting imidazole in a first stage with a 2-fold to 5-fold molar amount of formaldehyde at elevated temperatures, and then treating the reaction mixture in a second stage with nitric acid at from 100° to 140° C.

4,550,177

MALEIMIDO SUBSTITUTED AROMATIC CYCLOTRIPHOSPHAZENES

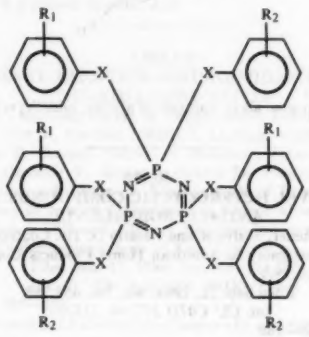
Devendra Kumar, Shakarpur Extension, India; George M. Fohlen, Millbrae, and John A. Parker, Los Altos, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 11, 1984, Ser. No. 599,126

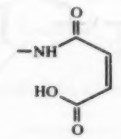
Int. Cl.[4] C07F *9/65*

U.S. Cl. 548—413 7 Claims

1. A cyclotriphosphazene derivative having the structure:

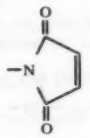


wherein R_1 is a maleamic acid group of the formula (a)



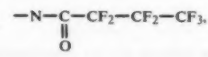
(a)

or a maleimido group of the formula (b)



(b)

X is O or NH and R_2 is selected from the class of hydrogen, primary amino, the maleamic acid group of formula (a), a, a perfluoroamic acid group of the formula



the maleimido group of formula (b) and a 2,2,3,3,-tetrafluorosuccinimido group.

4,550,178
DYE MIXTURE OF 1,4-DIAMINO ANTHRAQUINONE-N-GAMMA-METHOXY PROPYL-2,3-DICARBOXIMIDE AND 1,4-DIAMINO ANTHRAQUINONE-N-METHOXYETHOXY PROPYL-2,3-DICARBOXIMIDE, PROCESSES FOR PRODUCING IT, USEFUL FOR DYEING AND PRINTING HYDROPHOBIC FIBER MATERIALS.

Urs Karlen, Magden; Roland Putzar, Hofstetten, and Rudolf Schaulin, Riehen, all of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

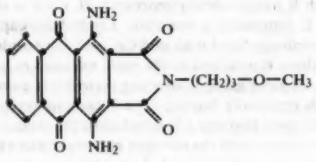
Filed Feb. 8, 1984, Ser. No. 578,164

Claims priority, application Switzerland, Feb. 17, 1983, 893/83

Int. Cl.⁴ C07D *487/00*

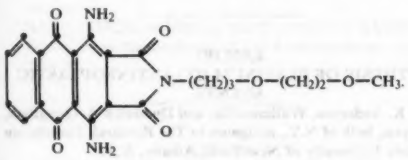
U.S. Cl. 548—426 **1 Claim**

1. Homogeneous mixed crystals of a dye mixture consisting of 1 part of the dye of the formula



(I)

and 0.5–5 parts of the dye of the formula



(II)

4,550,179
N-(1-ALLYL-2-PYRROLIDINYL-METHYL) 2-METHOXY-4-AMINO-5-METHYLSULFAMOYL BENZAMIDE

Jacques Perrot, and Michel Thominet, both of Paris, France, assignors to Societe d'Etudes Scientifiques et Industrielles de l'Ile-de France, Paris, France

Continuation of Ser. No. 296,164, Aug. 25, 1981, Pat. No. 4,405,636. This application Feb. 15, 1983, Ser. No. 466,573

Claims priority, application France, Aug. 28, 1980, 80 18635

Int. Cl.⁴ A61L *31/40;* **C07D** *207/09*

U.S. Cl. 548—571 **1 Claim**

1. As a new product, N-(1-allyl-2-pyrrolidinyl-methyl)2-methoxy-4-amino-5-methylsulfamoyl benzamide, quaternary ammonium salts thereof, N-oxides thereof, optical isomers thereof and their pharmacologically acceptable acid addition salts.

4,550,180
METHOD FOR MANUFACTURE OF N-FORMYLASPARTIC ANHYDRIDE

Tadashi Takemoto, Kawasaki; Toyoto Hijiya, Yokosuka, and Tetsuo Yamatani, Yokkaichi, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Mar. 15, 1984, Ser. No. 589,685

Claims priority, application Japan, Mar. 25, 1983, 58-50245

Int. Cl.⁴ C07D *307/22*

U.S. Cl. 549—253 **5 Claims**

1. In a method for the manufacture of N-formylaspartic acid anhydride which comprises reacting a mixture of aspartic acid, formic acid and acetic anhydride in the presence of an entraining organic solvent, an improvement comprising adding to the mixture, prior to or during the course of reaction, an oxide, hydroxide or a salt, or a hydrate thereof, of a metal, selected from the group consisting of sodium, lithium, potassium, magnesium, calcium, copper, zinc, aluminum and iron; wherein said salt is selected from the group consisting of carbonate, acetate, chloride, nitrate, phosphate or sulfate.

4,550,181
PROCESS FOR PREPARING GAMMA-CAPROLACTONE FROM POLYCAPROLACTONE

Jawad H. Murib, Cincinnati, and John H. Kahn, Wyoming, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Jun. 25, 1984, Ser. No. 624,308

Int. Cl.⁴ C07D *307/32*

U.S. Cl. 549—326 **22 Claims**

1. A process for preparing gamma-caprolactone comprising heating polycaprolactone in the presence of catalytically effective amount of an acid comprised of a hydrogen halide in a water solution at a temperature in the range of about 175° C. to about 275° C.

4,550,182
PREPARATION OF α-TOCOPHEROL

Hansgeorg Ernst, Ludwigshafen; Henning-Peter Gehrken, Lambsheim, and Joachim Paust, Neuhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

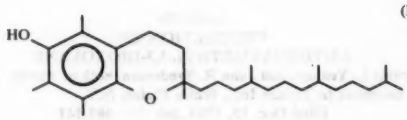
Filed Mar. 12, 1984, Ser. No. 588,374

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1983, 3309158

Int. Cl.⁴ C07D *311/72*

U.S. Cl. 549—408 **13 Claims**

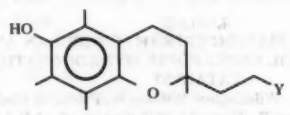
1. A process for the preparation of α-tocopherol of the formula I



(I)

by reacting a chroman derivative with a C_{14}-Grignard reagent using a di-alkali metal tetrahalocuprate catalyst in a Schlosser-Fouquet reaction, wherein

(a) a chroman derivative of the formula II



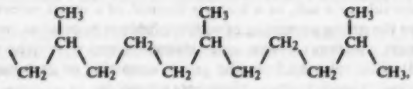
(II)

where Y is one of the leaving groups —Br, —I, -p-tosyl or benzenesulfonyl, especially —Br, is used and is reacted, at from −70° to 0° C.,

(b) first with a solution of from 0.8 to 1.1 equivalent of a Grignard reagent of the formula III

$$X—Mg—R \qquad \text{(III)}$$

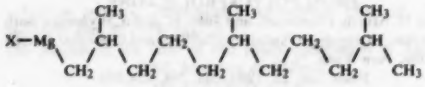
where X is Cl, Br or I and R is straight-chain or branched alkyl of 1 to 14 carbon atoms, preferably methyl, ethyl or



and then

(c) with a solution of from 1.05 to 2 equivalents of a Grignard reagent of the formula IIIa

(IIIa)



in an ether solvent and in the presence of a solution of a di-alkali metal tetrahalocuprate in an ether solvent.

4,550,183

PURIFICATION OF TOCOPHEROLS

Stephen M. Willging, Minneapolis, Minn., assignor to Henkel Corporation, Minneapolis, Minn.

Filed Aug. 2, 1984, Ser. No. 636,884
Int. Cl.[4] C07D *311/72*
U.S. Cl. 549—413 **14 Claims**

1. A process for obtaining tocopherol from organic material containing such, comprising:

(a) contacting the organic material containing tocopherol with a sufficient amount of caustic methanol whereby two phases are formed, one being a tocopherol-enriched caustic methanol solution, and the other being an organic phase,

(b) separating the two phases,

(c) contacting the tocopherol-enriched caustic methanol with a neutralizing acid whereby the methanol becomes a substantially neutralized solution, and

(d) recovering the tocopherol from the substantially neutralized methanol solution.

4,550,184

PRODUCTION OF 2-HYDROXYMETHYL-1,3-DIOXOLANE

Ernest L. Yeakey, and John R. Sanderson, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 19, 1984, Ser. No. 683,441
Int. Cl.[4] C07D *317/00*
U.S. Cl. 549—453 **9 Claims**

1. A method for the preparation of 2-hydroxymethyl-1,3-dioxolane which comprises reacting 1,3-dioxolane with formaldehyde under non-acidic conditions in the presence of an organic peroxide.

4,550,185

PROCESS FOR MAKING TETRAHYDROFURAN AND 1,4-BUTANEDIOL USING PD/RE HYDROGENATION CATALYST

Melinda A. Mabry, Wilmington; William W. Prichard, Hockessin, and Stanislaw B. Ziemecki, Wilmington, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 22, 1983, Ser. No. 564,372
Int. Cl.[4] C07D *307/08*
U.S. Cl. 549—508 **30 Claims**

1. A method for making tetrahydrofuran, 1,4-butanediol or mixture thereof by hydrogenating a hydrogenating precursor in the presence of a solvent medium and a catalyst on a carbon support, said catalyst comprising about 0.5% to 10% of palladium and about 1% to 10% of rhenium by total weight of supported catalyst, the palladium being present in the form of crystallites having an average size of about 10 nm to 25 nm and the rhenium being present in the form of a highly dispersed phase of crystallites having an average size of less than about 2.5 nm.

4,550,186

BINUCLEAR COPPER (II) CARBOXYLATES FORMED FROM AMINE-CARBOXYBORANES

Andrew T. McPhail, Durham; Bernard F. Spielvogel, Raleigh, and Iris H. Hall, Chapel Hill, all of N.C., assignors to Duke University, Durham, N.C.

Filed Jul. 11, 1983, Ser. No. 512,729
Int. Cl.[4] C07F *1/08*
U.S. Cl. 556—8 **8 Claims**

1. A compound of the formula

$$[Cu(R_3NBH_2CO_2)_2\text{-}L]_2$$

wherein each R independently represents H, C_1–C_{10} alkyl, or phenyl and L represents a non-toxic Lewis base capable of forming a coordinate bond with said Cu, with the provisos that any two or three R attached to the same nitrogen may represent a C_4–C_5 alkylene group containing up to 2 non-cumulative double bonds optionally having 1 or 2 carbons replaced by oxygen or nitrogen, that any 3 R attached to the same nitrogen when taken together with the nitrogen may represent a 6-membered aromatic ring containing 1, 2 or 3 nitrogen atoms, and that any R containing a carbon atom may be substituted with a hydroxyl, ether, ester, carboxyl, or amino functional group.

4,550,187

SYNTHESIS OF PLATINUM (IV) ANTINEOPLASTIC AGENTS

Wayne K. Anderson, Williamsville, and Dominick A. Quagliato, Amherst, both of N.Y., assignors to The Research Foundation of State University of New York, Albany, N.Y.

Filed Apr. 12, 1984, Ser. No. 599,642
Int. Cl.[4] C07F *15/00*
U.S. Cl. 556—137 **5 Claims**

1. A process of preparing pharmacologically pure tetrachloro-1,2-diaminocyclohexane platinum (IV) which comprises the sequential steps of:

(a) reacting 1,2-diaminocyclohexane with alkali metal chlorplatinate in degassed water in an inert atmosphere and isolating the thus formed 1,2-dichloro-1,2-diaminocyclohexane platinum (II) therefrom,

(b) suspending dichloro-1,2-diaminocyclohexane platinum (II) in aqueous hydrochloric acid, passing chlorine gas therethru, removing unreacted chlorine from the reaction mixture and isolating the tetrachloro-1,2-diaminoxyclohexane platinum (IV) therefrom.

4,550,188

PREPARATION OF CARBAMATES

Floro F. Frulla, Wallingford; Fred A. Stuber, North Haven, and Peter J. Whitman, Hamden, all of Conn., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 27, 1984, Ser. No. 625,060
Int. Cl.[4] C07C *125/065, 125/073*
U.S. Cl. 560—24 **19 Claims**

1. In a process for the preparation of carbamates by heating at a temperature of from about 75° C. to about 200° C. an organic carbonate selected from the group consisting of dialkyl, diaryl, diaralkyl, and cyclic esters of carbonic acid and an aromatic primary amine in the presence of a catalyst, the improvement which comprises employing aluminum metal as the catalyst with a promoter comprising a combination of a mercury salt and iodine.

4,550,189

SOIL REPELLENTS DERIVED FROM FLUORINATED ACRYLATES AND AROMATIC AMINES

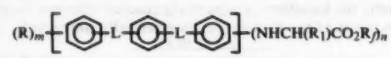
Michael G. Kelly, Coventry, R.I., and James H. Covill, Pineville, N.C., assignors to American Hoechst Corporation, Somerville, N.J.

Continuation of Ser. No. 410,737, Aug. 23, 1982,. This application Feb. 1, 1985, Ser. No. 697,293

Int. Cl.⁴ C07C *101/447*

U.S. Cl. 560—044 **10 Claims**

1. A compound of the formula:



wherein

n is 2 to 3 and m is 0 to 1; m+n equal 3;

L is a single carbon-carbon bond or a linking group selected from —O—, —S—, —SO_2—, —NH—, —NHCO—, —$CH_2N(R_2)CH_2$—, —CO—, and —C_aH_{2a}—;

wherein a is 1 to 6, and R_2 is H, lower alkyl or phenyl;

R is independently selected from lower alkyl, lower alkoxy, halogen, hydroxy, nitro, cyano, amino, lower alkylamino, lower acylamino, —CO_2R_3 and —$NHCH_2(R_1)CO_2R_3$, wherein R_3 is lower alkyl or —CH_2CH_2OH;

R_1 is H or CH_3; and

R_f is a fluorinated radical of the formula —$W(C_bF_{2b})Y$ wherein W has from 1 to 10 carbon atoms and is selected from alkylene and W'—Z—$(W'')_c$ where W' and W'' are alkylene,

Z is O, S, NHCH, or $NHSO_2$, and C is 0 to 1, Y is hydrogen, fluoro, or perfluoroalkoxy of 1 to 6 carbon atoms, and b is 2 to 20.

4,550,190

NAPHTHALENYLOXY CARBOXYLIC ACIDS

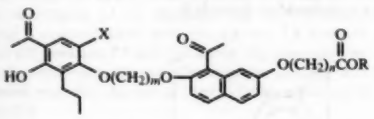
Ronald A. LeMahieu, North Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 21, 1983, Ser. No. 477,100

Int. Cl.⁴ C07C *69/76*

U.S. Cl. 560—053 **7 Claims**

1. A compound of the formula



1

wherein R is hydrogen or lower alkyl, X is hydrogen or halogen, m is an integer of 3 to 7, and n is an integer of 1 to 5, or, when R is hydrogen, a salt thereof with a pharmaceutically acceptable base.

4,550,191

PROCESS FOR PREPARING ESTERS OF 2'-(6'-METHOXY-2-NAPHTHYL)-PROPIONIC ACID

Graziano Castaldi, Briona, and Claudio Giordano, Vicenza, both of Italy, assignors to Blaschim S.p.A., Milan, Italy

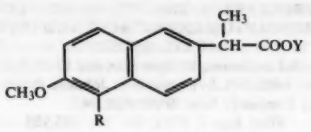
Filed Mar. 15, 1983, Ser. No. 475,391

Claims priority, application Italy, Mar. 22, 1982, 20307 A/82

Int. Cl.⁴ C07C *69/76*

U.S. Cl. 560—056 **3 Claims**

1. Process for preparing an ester of a 2-(6'-methoxy-2'-naphthyl)-propionic acid of the formula

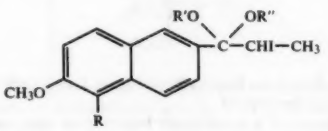


wherein

R is hydrogen or halogen; and

Y is an alkyl radical having from 1 to 6 carbon atoms, an iodoalkyl radical having from 2 to 6 carbon atoms, or a benzyl radical,

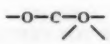
by rearranging a compound having the formula



wherein

R has the above mentioned meaning; and

R' and R'' are an alkyl radical having from 1 to 6 carbon atoms, a benzyl radical or, together, are an alkylene radical having from 2 to 6 carbon atoms which, together with the



group to which they are linked, forms a heterocyclic ring, in the presence of a protic medium, and in the absence of a Lewis acid.

4,550,192

FLUOROPHENOXYPHENOXYPROPIONATES AND DERIVATIVES THEREOF

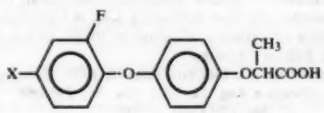
Richard B. Rogers, and B. Clifford Gerwick, III, both of Concord, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 1, 1983, Ser. No. 528,711

Int. Cl.⁴ C07C *69/76*

U.S. Cl. 560—62 **55 Claims**

1. A compound of the formula



(I)

wherein

X represents —Cl, —CF_3, —I, —Br, —OCF_3, —CF_2Cl, —CF_2H or —CF_2CCl_2H, and

agriculturally acceptable salts, amides, and esters thereof.

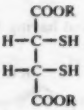
4,550,193

PROCESS FOR THE PREPARATION OF 2,3-DIMERCAPTOSUCCINIC ACID AND ITS LOWER ALKYL ESTERS

Martin K. O. Lindemann, Bridgewater, and Elvin R. Lukenbach, Somerset, both of N.J., assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J.

Filed Jun. 7, 1982, Ser. No. 385,953
Int. Cl.[4] C07C *149/20, 148/00*
U.S. Cl. 560—147 **5 Claims**

1. The process for the preparation of 2,3-dimercaptosuccinic acid and esters thereof of the formula



wherein R is H or lower alkyl of from 1 to 3 carbon atoms comprising the steps of

(1) reacting at a temperature below room temperature sodium thiosulfate with acetylene dicarboxylic acid in the presence of a strong acid with a pH below about 4 to from an alkylthiosulfate; and

(2) subjecting said alkylthiosulfate to an acid hydrolysis utilizing a strong acid and at a temperature up to about 80° C. said hydrolysis being in the presence of an alcoholic solution when said esters are prepared.

4,550,194

PROCESS FOR THE PREPARATION OF POLYETHER-ESTER POLYOLS

Curtis J. Reichel, Wyandotte, and Robert J. Hartman, Southgate, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 364,336, Apr. 1, 1982,. This application Sep. 29, 1982, Ser. No. 426,311
The portion of the term of this patent subsequent to Aug. 13, 2002, has been disclaimed.
Int. Cl.[4] C07C *67/08, 67/26*
U.S. Cl. 560—200 **8 Claims**

1. In a process for the preparation of polyether-ester polyols by the reaction of a polyether polyol and an organic compound containing both ethylenic unsaturation and an anhydride group wherein said reaction comprises reacting

(a) a polyether polyol,

(b) an organic compound containing both ethylenic unsaturation, and an anhydride group forming a half ester,

(c) further reacting with an alkylene oxide to obtain a product with an acid number of 5 mg KOH/gm or less, the improvement which comprises conducting said reactions in the presence of an effective amount of a catalyst selected from the group consisting of calcium naphthenate and cobalt naphthenate.

4,550,195

MANUFACTURE OF PENT-3-ENOIC ACID AND ITS ALKYL ESTERS

Rolf Platz, Mannheim; Rudolf Kummer, Frankenthal; Heinz-Walter Schneider, and Kurt Schwirten, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 805,416, Jun. 10, 1977, abandoned. This application Aug. 21, 1981, Ser. No. 295,088
Int. Cl.[3] C07C *67/38*
U.S. Cl. 560—206 **9 Claims**

1. In a process for the manufacture of pent-3-enoic acid alkyl esters of the formula I

$$CH_3—CH=CH—CH_2—CO—OR \qquad I$$

where R is alkyl of 1 to 4 carbon atoms in which butadiene is carbonylated with carbon monoxide and a compound ROH where R is defined as above at from 300 to 1,000 bars carbon monoxide pressure and a temperature of from 80° to 160° C. in the presence of cobalt catalysts and nitrogen bases, the improvement which comprises: using as the butadiene to be carbonylated a C_4 hydrocarbon cut containing butadiene, butenes, butynes and butanes and selectively carbonylating butadiene by using as the nitrogen base a tertiary amine having a pK_a of from 3 to 11 in an amount of from about 0.5 to 1 mole of tertiary amine per mole of butenes contained in the C_4 cut, whereby the butadiene is selectively reacted whereas the other components of the C_4 cut remain essentially unreacted.

4,550,196

PROCESS FOR THE PREPARATION OF CARBOXYLIC ACIDS STARTING FROM VICINAL WATER-SOLUBLE DIOLS

Carlo Venturello, and Marco Ricci, both of Novara, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Apr. 12, 1984, Ser. No. 599,677
Claims priority, application Italy, Apr. 15, 1983, 20605 A/83
Int. Cl.[4] C07C *51/285*
U.S. Cl. 562—418 **9 Claims**

1. A process for preparing monocarboxylic or dicarboxylic acids by means of an oxidative scission of vicinal diols with H_2O_2, characterized in starting from vicinal diols, either terminal or internal, that are soluble in water and possibly carry functional groups that are inert under the reaction conditions; said vicinal diols being made to react, in an aqueous solution, with H_2O_2 at a temperature between 0° and 120° C. and at a pH value between 0.5 and 4, in the presence of a catalytic system consisting of tungstic acid or an alkali metal tungstate and possibly of phosphoric or arsenic acid or an alkali metal salt thereof.

4,550,197

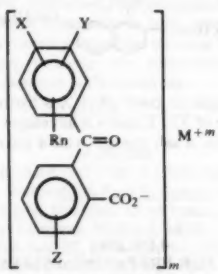
OVERBASED ORTHO-CARBOXY PHENYLPHENONE LUBRICATING OIL ADDITIVES

Michael A. Shippey, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 28, 1984, Ser. No. 656,043
Int. Cl.[4] C07C *65/20*
U.S. Cl. 562—460 **12 Claims**

1. A product prepared by the process which comprises reacting a compound of formula I:

I



wherein

R is alkyl of from 1 to 30 carbon atoms;

X, Y and Z are independently selected from hydrogen or hydroxy;

M is a metal selected from the group consisting of strontium, barium, calcium, magnesium, sodium and potassium;

m is an integer equal to the valence of M;

n is an integer from 1 to 3; and

with the proviso that the sum of carbon atoms in all R be at least 10 carbon atoms; with from about 1 to about 50 equivalents of a basically reacting metal compound selected from the group consisting of

calcium oxide, hydroxide, or alkoxide of 1 to 3 carbon atoms;

magnesium oxide, hydroxide or alkoxide of 1 to 3 carbon atoms;

barium oxide, hydroxide or alkoxide of 1 to 3 carbon atoms;

sodium hydroxide or alkoxide of 1 to 3 carbon atoms;

potassium hydroxide or alkoxide of 1 to 3 carbon atoms; and

with from 1 to about 50 equivalents of carbon dioxide.

4,550,198

PURIFICATION OF TEREPHTHALIC ACID BY SUPERCRITICAL FLUID EXTRACTION

Allan S. Myerson, Marietta, Ga., assignor to Georgia Tech Research Institute, Atlanta, Ga.

Filed Nov. 4, 1982, Ser. No. 439,329

Int. Cl.⁴ C07C *51/43*

U.S. Cl. 560—486 **12 Claims**

1. The process of purifying terephthalic acid which comprises the steps of:

(a) dissolving impure terephthalic acid while at a temperature in the range of 191° K. to 1000° K. and a pressure within the range of 25 atm to 1000 atm in a fluid which is supercritical at the temperature and pressure of the dissolution to form a solution of impure terephthalic acid in the supercritical fluid;

(b) extending said solution to a reduced pressure to precipitate purified terephthalic acid as a solid; and

(c) recovering the precipitated terephthalic acid.

4,550,199

PROCESS FOR OBTAINING D,L-HOMOCYSTINE (I)

Michael Karrenbauer, Rodenbach; Axel Kleemann, Hanau; Theodor Lüssling, Konstanz-Litzelstetten, and Fritz Schäfer, Constance, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Mar. 15, 1984, Ser. No. 590,058

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1983, 3309761

Int. Cl.⁴ C07C *149/243*

U.S. Cl. 562—556 **7 Claims**

1. A process for obtaining D,L-homocystine by oxidation of the disodium salt of D,L-homocysteine comprising treating an aqueous solution of the disodium salt of D,L-homocysteine having a concentration between 0.4 and 1.6 moles/l and an initial pH between 7.0 and 8.0 under vigorous stirring with at least the equivalent amount of an aqueous solution of hydrogen peroxide and after the end of the oxidation adjusting the pH to about 5.3.

4,550,200

PROCESS FOR OBTAINING D,L-HOMOCYSTINE (II)

Michael Karrenbauer, Rodenbach; Axel Kleemann, Hanau; Theodor Lüssling, Konstanz-Litzelstetten, and Fritz Schäfer, Konstanz, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Mar. 15, 1984, Ser. No. 590,059

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1983, 3309762

Int. Cl.⁴ C07C *149/243*

U.S. Cl. 562—556 **7 Claims**

1. A process for obtaining D,L-homocystine comprising introducing molecular oxygen into an aqueous solution of the disodium salt of D,L-homocysteine having a concentration between 0.8 and 1.2 moles/l and an initial pH between 7.0 and 8.0 in the presence of a catalytic amount of Fe^{3+} ions until there is no longer an increase in pH and subsequently adjusting the pH to about 5.3 with stirring.

4,550,201

ORGANOPHOSPHORUS ENAMINES USEFUL AS EPOXY CURATIVES AND ADHESION PROMOTERS

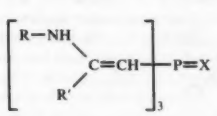
Milton D. Johnson, and Mohinder S. Chattha, both of Livonia, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 24, 1984, Ser. No. 685,377

Int. Cl.⁴ C07F *9/53*

U.S. Cl. 564—15 **6 Claims**

1. Organophosphorus enamine compounds useful as epoxy curing agents and adhesion promoters, said organophosphorus enamine comprising compounds having the general chemical formula:



wherein X is oxygen or sulfur, R′ is an alkyl or aryl group and R is the same or different alkyl group.

4,550,202

BENZOYLUREA COMPOUNDS, AND PESTICIDAL AND PHARMACEUTICAL COMPOSITIONS COMPRISING SAME

Marius S. Brouwer, and Arnoldus C. Grosscurt, both of Weesp, Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

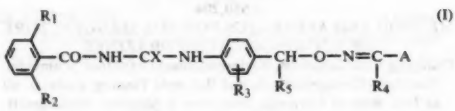
Filed Jan. 19, 1984, Ser. No. 572,145

Claims priority, application Netherlands, Jan. 24, 1983, 8300236

Int. Cl.⁴ C07C *157/12, 127/22*

U.S. Cl. 564—23 **5 Claims**

1. Benzoylurea compounds of the general formula



(I)

wherein R_1 is a halogen atom,

R_2 is a hydrogen atom or a halogen atom,

R_3 is a hydrogen atom or represents 1 or 2 substituents which are selected from the group consisting of chlorine, methyl and trifluoromethyl,

R_4 is a hydrogen atom, an alkyl group having 1–6 carbon atoms or a cycloalkyl group having 3–6 carbon atoms,

R_5 is a hydrogen atom or an alkyl group having 1–4 carbon atoms,

A is a phenyl group or a heteroaryl group having 1 or 2 nitrogen atoms, which groups may be substituted with 1–3 substituents which are selected from the group consisting of halogen, and alkyl, alkoxy, haloalkyl and haloalkoxy having 1–4 carbon atoms and

X is an oxygen or sulphur atom.

4,550,203

PROCESS FOR THE PREPARATION OF N-SUBSTITUTED N-CYANCARBOXYLIC ACID AMIDES

Friedrich Stockinger, Hölstein; Friedrich Lohse, Oberwil, and Helmut Zondler, Bottmingen, all of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

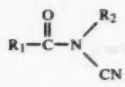
Filed Feb. 15, 1983, Ser. No. 466,456

Claims priority, application Switzerland, Feb. 23, 1982, 1106/82

Int. Cl.[4] C07C *125/08*

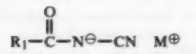
U.S. Cl. 564—105 3 Claims

1. A process for the preparation of an N-substituted N-cyanocarboxylic acid amide of the formula I



(I)

in which R_1 is a hydrogen atom, alkyl having 1–16 C atoms, cycloalkyl having 5–8 C atoms or aryl having 6 or 10 ring C atoms and R_2 is alkyl having 1–8 C atoms, cycloalkyl having 5–8 C atoms or benzyl, which comprises reacting, in a molar ratio, 1 mol of an N-cyanocarboxylic acid amide salt of the formula II



(II)

in which R_1 is as defined under formula II and M^+ is an Na or K cation, either with 1 mol of a compound of the formula III

(III)

in which R_2 is as defined under formula I and X is a chlorine, bromine or iodine atom, or, if R_2 in formula I is methyl or ethyl, with 1 mol of dimethyl or diethyl sulfate or trimethyl or triethyl phosphonate, as the alkylating agent, in a polar aprotic solvent.

4,550,204

METHOD AND APPARATUS FOR THE MANUFACTURE OF N,N'-BIS-(AROYL)HYDRAZINES

Wolfgang Von Gentzkow, Kleinsendelbach; Manfred Schmiedel, Nurnberg-Grossgründlach, and Reinhold Tussing, Redwitz, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 10, 1983, Ser. No. 474,175

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1982, 3210859

Int. Cl.[4] C07C *102/06*

U.S. Cl. 564—134 15 Claims

1. A method for the manufacture of N,N'-bis-(aroyl)-hydrazines by catalytic reaction of an aryl carboxylic acid alkyl ester with hydrazine or aroylhydrazine as reaction ingredients, which comprises: reacting the reaction ingredients at a substantially stoichiometric mass ratio and in an inert medium of low volatility which is liquid to wax-like under the reaction conditions and is a non-solvent for the reaction ingredients and product, to form a paste-like product dispersion and freeing the dispersion of volatile reaction components by applying a vacuum to the dispersion.

4,550,205

DIPHENYL ETHERS HAVING HERBICIDAL ACTIVITY

Gerard B. Paerels, and Cornelis W. Raven, both of Weesp, Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

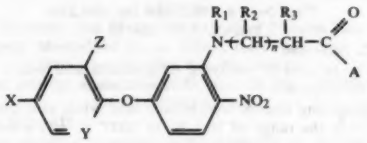
Filed Nov. 4, 1982, Ser. No. 439,185

Claims priority, application Netherlands, Nov. 9, 1981, 8105047

Int. Cl.[4] C07C *103/28, 103/34, 69/612;* A01N *37/18*

U.S. Cl. 564—166 4 Claims

1. An ether of the general formula



wherein

X is a hydrogen atom, a halogen atom, a nitro group, an optionally halogenated alkyl, alkoxy or alkylthio group having 1–6 carbon atoms, or an alkanoyl group having 1–4 carbon atoms;

Y is a nitrogen atom or a group of the formula CH or CCl;

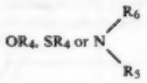
Z is a hydrogen atom, a halogen atom, a nitro group, an optionally halogenated alkyl group having 1–4 carbon atoms, or an alkanoyl group having 1–4 carbon atoms;

n is 0–2;

R_1 is a hydrogen atom, or an alkyl or alkanoyl group having 1–4 carbon atoms;

R_2 and R_3 are equal or different and represent hydrogen atoms or alkyl groups having 1–4 carbon atoms; and

A is a group of the general formula



wherein

R_4 is a hydrogen atom, an alkyl group having 1–6 carbon atoms, or a cation of an alkali metal, alkaline earth metal or an alkylated or non-alkylated ammonium group, and

R_5 and R_6 are equal or different and represent hydrogen atoms, dialkylamino groups wherein the alkyl groups each have 1–4 carbon atoms, alkyl groups having 1–4 carbon atoms, or wherein

R_5 and R_6 together with the nitrogen atom to which they are bound can form a heterocyclic ring which may comprise a second hetero atom selected from O, S or N; with the provisos, that X and Z are not both hydrogen atoms or nitro groups, and that if A is a group of the formula OR_4 then R_1 is not an alkyl group, and with the further proviso, that, if Y=CH, Z=Cl, X=CF_3 and n=O, then R_1=H and R_3=H or C_1–C_3 alkyl.

4,550,206

METHOD OF PREPARING TETRAHALOBENZENE COMPOUNDS, CHEMICAL INTERMEDIATES USED THEREIN AND CERTAIN OF THE COMPOUNDS THEMSELVES

Peter J. Richardson, Rochdale, England, assignor to Imperial Chemical Industries Limited, London, England

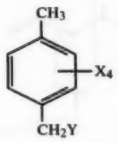
Filed Jan. 11, 1984, Ser. No. 569,895

Claims priority, application United Kingdom, Jan. 26, 1983, 8302155

Int. Cl.[4] C07C *87/30*

U.S. Cl. 564—289 7 Claims

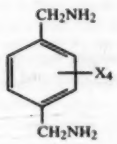
1. Method of preparing tetrahalobenzene compounds of the formula (I):



(I)

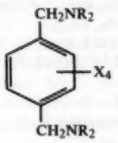
in which each X is independently chloro or fluoro and Y is hydrogen or $—N^+R_3A^-$ in which each R is independently C_{1-4} alkyl, and A is a radical capable of forming an anion A^-, the method comprising the steps of

(a) alkylating a compound of formula (II):



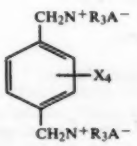
(II)

or a salt thereof, to form a compound of formula (III):



(III)

(b) treating the compound of formula (III) with a quaternizing agent of formula RA to form a compound of formula (IV):



(IV)

and

(c) partially or completely reductively cleaving the compound of formula (IV) to replace one or both $—N^+R_3A^-$ groups by hydrogen.

4,550,207

PROCESS FOR THE PREPARATION OF BENZENE COMPOUNDS

Günter Stephan, Bergisch-Gladbach, and Karl Heinz Schündehütte, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

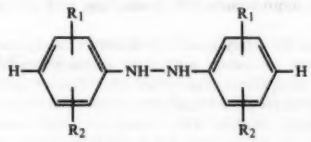
Filed Mar. 4, 1977, Ser. No. 774,453

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1976, 2609530

Int. Cl.[4] C07C *109/04*

U.S. Cl. 564—311 9 Claims

1. Process for the preparation of hydrazobenzenes from azoxybenzenes by catalytic reduction with hydrogen or hydrazine hydrate in the presence of 0.1–5 g of Raney nickel per mol of the azoxy compound characterized in that the reduction is carried out in aqueous or non-aqueous lower alcohols wherein the amount of water is at most 50% by weight, in the presence of a material selected from the group consisting of alkali metal hydroxides and alkaline earth metal hydroxides further characterized in that hydrazobenzenes of the formula



wherein

R_1 denotes hydrogen, amino, C_1–C_4-alkyl, C_1–C_4-alkoxy which is optionally substituted by carboxyl; carboxyl, sulpho or halogen and

R_2 denotes amino, C_1–C_4-alkyl, C_1–C_4-alkoxy which is optionally substituted by carboxyl; carboxyl sulpho or halogen,

are prepared from the corresponding azoxybenzenes.

4,550,208

PREPARATION OF 4,4'-DIAMINOBENZOPHENONES

Walter Disteldorf, Wachenheim; Wolfgang Eisfeld, Ludwigshafen, and Rolf-Dieter Kohler, Edingen-Neckarhausen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

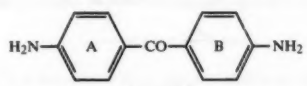
Filed Nov. 21, 1984, Ser. No. 673,938

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1983, 3342462

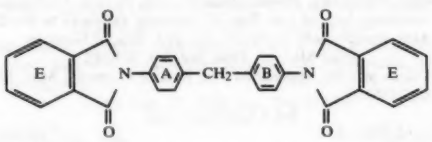
Int. Cl.[4] C07C *97/10*

U.S. Cl. 564—329 5 Claims

1. A process for the preparation of a 4,4'-diaminobenzophenone of the formula I



where the rings A and B can be further substituted, wherein a compound of the formula II



where the rings A, B and E can be substituted, is oxidized with

aqueous nitric acid in the presence of nitrobenzene or of an alkanoic acid and under superatmospheric pressure, and the reaction product is cleaved.

4,550,209

PROCESS FOR THE PREPARATION OF LINEAR POLYETHYLENEPOLYAMINES BY REACTING MONOETHANOLAMINE WITH ETHYLENEDIAMINE IN THE PRESENCE OF AN INTERCALATIVELY ACTIVE CATALYST

Susan D. Unvert, Austin; Steven H. Vanderpool, New Braunfels, and John F. Knifton, Austin, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 26, 1984, Ser. No. 634,713
Int. Cl.[4] C07C *85/06*
U.S. Cl. 564—479 **14 Claims**

1. In a method wherein monoethanolamine is reacted with ethylenediamine in the presence of a catalyst to provide an essentially noncyclic product comprising polyethylenepolyamines, the improvement for conducting said process which comprises:

(a) using, as the catalyst, an intercalatively catalytically active tetravalent zirconium polymeric reaction product of an organo phosphonic acid or an ester thereof with a compound of tetravalent zirconium reactive therewith; and

(b) contacting a mixture of ethylenediamine and monoethanolamine in the molar ratio of about 1 to about 5 moles of ethylenediamine per mole of monoethanolamine with said catalyst at a temperature of about 250° to about 400° C.

4,550,210

PROCESS FOR PREPARING HALOGEN-TERMINATED OLIGOMERS USEFUL IN THE PRODUCTION OF ACETYLENE-TERMINATED RESINS

Frederick L. Hedberg, Xenia, and Marilyn R. Unroe, Dayton, both of Ohio, assignors to The University of Dayton, Dayton, Ohio

Filed Aug. 12, 1983, Ser. No. 522,940
Int. Cl.[4] C07C *147/10, 147/12*
U.S. Cl. 568—33 **6 Claims**

1. A process for producing halogen-terminated oligomers useful in the production of acetylene-terminated oligomers which consists essentially of reacting a free aromatic diphenol selected from the group consisting of a sulfonyldiphenol, and alkylenediphenol, thiodiphenol and resorcinol with a dihalobenzene compound selected from the group consisting of 1,3-digromobenzene, 1,4-dibromobenzene, and mixtures thereof in the presence of at least a stoichiometric amount of cuprous oxide in an Ullman-type condensation in 2,4,6-collidine.

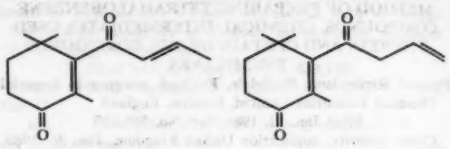
4,550,211

PREPARATION OF COMPOUNDS OF THE 4-OXODAMASCONE SERIES, AND NOVEL SCENTS FROM THIS CLASS OF COMPOUNDS

Lothar Janitschke, Kleinniedesheim, and Werner Hoffmann, Neuhofen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 12, 1984, Ser. No. 588,882
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1983, 3309169
Int. Cl.[4] C07C *45/42*
U.S. Cl. 568—361 **7 Claims**

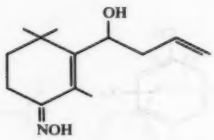
1. A process for the preparation of the compounds of the formulae Ia and Ib



Ia Ib

wherein

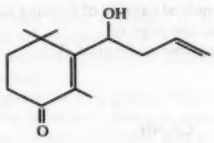
A. 2,4,4-trimethylcyclohex-2-en-1-one oxime of the formula IIb



(IIb)

is treated with a strong aqueous acid at from 30° to 80° C.,

B. the resulting ketone of the formula IIIb



(IIIb)

is oxidized in a conventional manner, and

C. if desired, the resulting compound Ib is isomerized in a conventional manner.

4,550,212

CATALYSTS

Tod K. Shioyama, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 9, 1982, Ser. No. 356,561
Int. Cl.[4] C07C *45/34*
U.S. Cl. 568—401 **7 Claims**

1. A composition useful for the catalytic oxidation of olefins to carbonyl compounds comprising:

(a) a palladium component;

(b) a heteropolyacid component conforming to the general formula

$$H_m[X_xMo_aV_bM_yO_z]$$

in which:

X is B, Si, Ge, P, As, Se, Te or I;

M is W, Nb, Ta or Re;

m, a, b and z are integers;

x is zero or an integer;

and y is zero or an integer such that

$$6 \leqq \frac{y+a+b}{z} \leqq 12$$

and $m+Nx+6a+5b+N'y \leqq 2z$

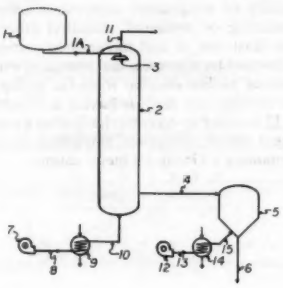
in which each of N and N' is the number of the group of the periodic table to which X and M respectively belong; and

(c) a boric acid component.

4,550,213
METHOD OF MANUFACTURE FOR PARAFORMALDEHYDE PRILLS

Hubert H. Thigpen, Corpus Christi, Tex., and Richard J. Clos, Vancouver, Wash., assignors to Celanese Corporation, New York, N.Y.

Filed Jun. 29, 1984, Ser. No. 625,942
Int. Cl.[4] C07C *47/02*
U.S. Cl. 568—458 1 Claim



1. In process of manufacturing paraformaldehyde prills not subject to autocatalyzed polymerization during storage from an aqueous solution containing at least about 85 weight percent formaldehyde which comprises continuously: (a) polymerizing the formaldehyde in the presence of a basic catalyst; (b) extruding the polymerized formaldehyde through a nozzle to form prills which fall into a countercurrent flow of gas in a tower to further polymerize and solidify the product; (c) collecting the solidified prills; and (d) removing the prills of solid paraformaldehyde from the tower, the improvement which consists of:

(1) admixing an aqueous solution containing sodium hydroxide with the aqueous formaldehyde to a final sodium ion concentration of from about 0.5 to about 5 parts per million;

(2) aging the resulting mixture by holding the mixture at from about 100° C. to about 130° C. for about 10 to about 60 minutes to further polymerize the formaldehyde;

(3) extruding the aged mixture into the tower at from about 100° to about 130° C.;

(4) removing the prills into a separate quenching vessel wherein the prills further polymerize and dry at from about 15° to about 30° C., for from about 3 to about 5 hours; and

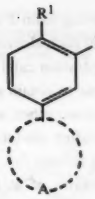
(5) operating the quenching vessel continuously in a plugged flow manner.

4,550,214
BLOCKED VINYL BIPHENYL COMPOUNDS

Avinash C. Mehta, Belmont, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 222,361, Jan. 5, 1981, Pat. No. 4,412,050. This application Oct. 19, 1983, Ser. No. 543,313
Int. Cl.[4] C07C *43/166, 43/30, 69/773, 69/353*
U.S. Cl. 568—643 7 Claims

1. A compound of the formula



wherein one of R^1 and R^2 is vinyl and the other is hydrogen, and the cyclic moiety A is a -2,5-; -2-3; or -3-4-di-OR-1-phenyl moiety wherein R is a hydroxy-protecting group capable of removal so as to regenerate the hydroxy group.

4,550,215
PROCESS FOR THE PREPARATION OF PERYLENE

Fridolin Bäbler, Marly, Switzerland, assignor to Ciba Geigy Corporation, Ardsley, N.Y.

Filed Mar. 28, 1984, Ser. No. 594,144
Claims priority, application Switzerland, Apr. 8, 1983, 1898/83
Int. Cl.[4] C07C *1/20*
U.S. Cl. 585—469 9 Claims

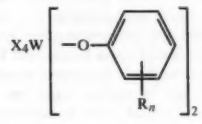
1. A process for the preparation of perylene by heating a perylenecarboxylic acid or an anhydride or salt thereof, in the presence or absence of a metal oxide, metal hydroxide or metal carbonate, to temperatures in the range from 380° to 550° C., which process is carried out under a pressure above 0.7 bar and the perylene so obtained is removed from the reaction vessel with a stream of inert gas.

4,550,216
CATALYST FOR THE METATHESIS OF OLEFINS

Jean M. M. Basset; Michel Leconte, both of Villeurbanne; Jean Ollivier, Arudy, and Francoise Quignard, Lyons, all of France, assignors to Societe Nationale Elf Aquitaine, France

Filed Jun. 15, 1984, Ser. No. 621,041
Claims priority, application France, Jun. 15, 1983, 83 09876; Jun. 8, 1984, 84 09001
Int. Cl.[4] C07C *3/62*
U.S. Cl. 585—645 12 Claims

1. In the process for the metathesis of olefins by the contact therewith with a catalytic system comprising a compound of tungsten, the improvement which comprises employing as the compound of tungsten, a compound of the formula



in which X is halogen, R is an electronegative group or atom, and n is an integer from 1 to 5.

4,550,217
CONVERSION OF METHANOL TO OLEFINS USING LARGE SIZE CATALYST PARTICLES

Kenneth R. Grazinni, Thorofare, and Ajit V. Sapre, West Deptford, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 29, 1984, Ser. No. 645,195
Int. Cl.[4] C07C *1/20*
U.S. Cl. 585—324 12 Claims

9. In a process for converting a feed comprising at least one

lower aliphatic alcohol having from 1 to 3 carbon atoms and/or corresponding eithers of such alcohols, wherein said feed is first contacted with a dehydration catalyst at elevated temperatures in a first reaction zone to obtain a product comprising a mixture of water and at least one ether, and said product of said first reaction zone is thereafter contacted with a crystalline silicate zeolite catalyst in a second reaction zone, said zeolite having a silica-to-alumina ratio of at least about 12, and a Constraint Index of about 1 to 12, withdrawing from said second reaction zone an effluent comprising a mixture of light olefins, paraffin, hydrocarbons and aromatic hydrocarbons, and segregating said light olefins from said effluent, the improvement comprising controlling the activity of the catalyst by selecting the particle size of said crystalline silicate zeolite catalyst wherein the activity of said catalyst increases with increasing catalyst particle size.

4,550,218

HYDROCARBON SYNTHESIS WITH ZEOLITE CATALYST OF IMPROVED HYDROTHERMAL STABILITY

Pochen Chu, West Deptford, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 585,615, Mar. 5, 1984, abandoned. This application Mar. 8, 1985, Ser. No. 708,386

Int. Cl.[4] **C07C** *1/24*

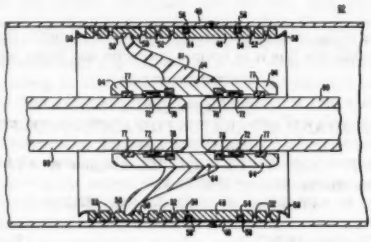
U.S. Cl. 585—408 **12 Claims**

1. In a catalytic process for the conversion of a feed consisting essentially of oxygenated compounds selected from the group consisting of methanol, dimethyl ether, and ethanol wherein at least one of said oxygenated compounds is contacted at elevated temperatures and pressures with a crystalline aluminosilicate zeolite selected from the group consisting of large pore zeolites and zeolites having a Constraint Index of from 1 to 12 in order to convert the feed to hydrocarbons, the improvement which comprises employing as the catalyst a zeolite containing a Group IB metal cation.

4,550,219
MODULARLY CONSTRUCTED GAS-INSULATED TRANSMISSION LINE, AND METHOD OF ASSEMBLING SAME

Philip C. Bolin, Wilkins Township, Allegheny County, Pa.; Gary K. Bowman, Westborough, Mass.; Charles S. Ellis, Norcross, Ga.; Melvyn D. Hopkins, North Grafton, and Richard E. Kane, Northborough, both of Mass., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 11, 1985, Ser. No. 722,569
Int. Cl.[4] H01B *9/06;* H02G *5/06, 15/24*
U.S. Cl. 174—21 C 3 Claims



1. A method of assembling a gas-insulated transmission line comprising:

(a) assembling as a modular member a backup ring, an insulating support held by said backup ring, and a connection member supported by said insulating support;

(b) connecting both electrically and physically two inner conductor sections to said connection member;

(c) gas-tightly securing two outer sheath sections to each other and to said backup ring; and

(d) inserting an insulating gas within said outer sheath sections.

2. A gas-insulated transmission line comprising:

a modular member comprising a backup ring, an insulating support held by said backup ring, and a connection member supported by said insulating support;

two inner conductor sections electrically connected to each other by said connection member and physically supported by said insulating support through said connection member;

two outer sheath sections gas-tightly secured to said backup ring and each other, said outer sheath sections enclosing said inner conductor sections and said modular member; and

an insulating gas electrically insulating said inner conductor sections from said outer sheath sections.

4,550,220
SPLICE INSULATOR ASSEMBLY

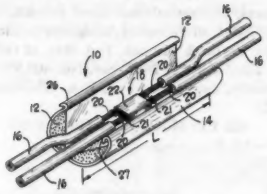
Roy A. Kitchens, Pikeroad, Ala., assignor to National Industries, Inc., Montgomery, Ala.

Filed Nov. 4, 1983, Ser. No. 549,251
Int. Cl.[4] H01R *4/70;* H02G *15/113*
U.S. Cl. 174—138 F 3 Claims

1. A splice insulator for covering exposed metal conductors in an electric connection comprising:

an elongated core member of flexible closed cell foam split down its middle to define two flat surfaces to engage and insulate an electric connection; and

a flexible outer plastic sheath attached to said core member for holding said core member in place, said sheath being capable of being flexed between an open position with said two flat surfaces of said core member separated to accommodate the electrical connection and a closed position where said two flat surfaces engage and surround the electrical connection, said sheath having two longitudinally extending edges which define a tongue and groove connector that locks said sheath in said closed position about said core member causing the flat surfaces to engage an electrical connection placed between the flat surfaces, said core member and said sheath being adhesively

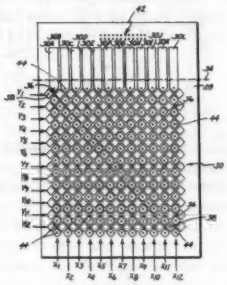


bonded to each other with said sheath conforming to exterior portions of said core member and said longitudinally extending edges bordering the flat surfaces of the core member.

4,550,221
TOUCH SENSITIVE CONTROL DEVICE

Scott Mabusth, 740 N. Brown Rd., Long Lake, Minn. 55356

Filed Oct. 7, 1983, Ser. No. 539,810
Int. Cl.[4] G08C *21/00*
U.S. Cl. 178—18 18 Claims



1. A touch sensitive device for translating touch location into output signals, the device comprising:

a substrate;

first and second interleaved, closely spaced, non-overlapping arrays of conductive plates supported by the substrate, the plates of each array having edges proximate to but spaced from the edges of plates of the other array, the plates of each array being aligned in a plurality of rows and a plurality of columns, the plates of each column of the first array being connected together and the plates of each row of the second array being connected together;

an insulating layer overlying the first and second arrays so that when an outer surface of the insulating layer is touched, capacitance of at least one of the columns of plates of the first array and the rows of plates of the second array underlying the insulating layer at a location being touched exhibits a change of capacitance with respect to ambient ground;

means for measuring capacitance of each column of the first array and each row of the second array; and

means for providing the output signals as a function of the measured capacitances; wherein the output signals include coordinate output signals and function command output signals; and wherein the means for providing output signals provides coordinate output signals when a change in capacitance is measured at both a row and a column, and provides function command output signals when a change in capacitance is measured at a column without a corresponding change in capacitance being measured at a row.

4,550,222

PROCESS FOR INTERCEPTION-PROTECTED FREQUENCY BAND COMPRESSED TRANSMISSION OF SPEECH SIGNALS

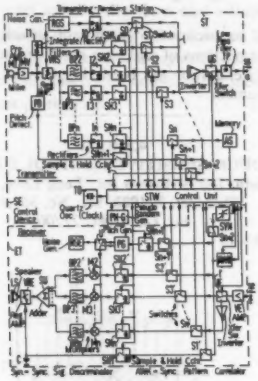
Manfred Hanni, Puchheim, and Josef Brusch, Unterhaching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 23, 1982, Ser. No. 400,997

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1981, 3138523

Int. Cl.[4] H04K *1/00*; H04L *9/00*

U.S. Cl. 179—1.5 R **10 Claims**



1. In a process for interception-resistant transmission of speech signals, in which speech signals are sampled, in a time overlapping manner, to obtain, in each of a plurality of analysis intervals, sample values of mean spectral power and predetermined speech parameters over a plurality of spectral channels, the sample values and at least one item of synchronizing information for each analysis interval are combined into a sum signal, the sum signals are transmitted in respective time-division multiplex frames, the sum signals are received and distributed, frame-by-frame, and the original speech signals are synthetically generated from the distributed sample values, the improvement therein comprising the steps of:

transmitting the sample values and the synchronizing information pseudo-randomly internested within consecutive frames in the sum signal; and

shaping the sum signal with a shaping network for transmission.

4,550,223

TEST DEVICE, AND METHOD FOR LOCATING FAULTS IN A TWO-LEAD LINE

Jean-Pierre R. Poitevin, 53, rue Denis Gogue, Clamart, France (92140)

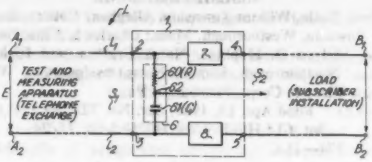
Filed Mar. 8, 1982, Ser. No. 355,330

Claims priority, application France, Apr. 17, 1981, 81 07784

Int. Cl.[4] H04B *3/46*

U.S. Cl. 179—175.3 F **35 Claims**

1. A test device for locating faults in a two-lead line, said test device comprising a dipole circuit including a resistor connected in series with a capacitor, terminals of the dipole circuit being connected between the two leads of said line so current



on one of the leads flows through the dipole circuit to the other lead while the line is in normal operation and being tested.

4,550,224

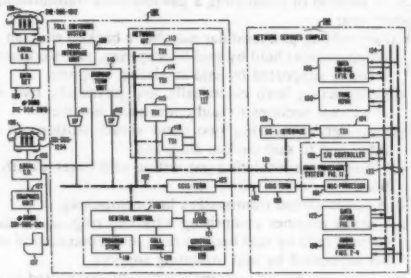
METHOD AND APPARATUS FOR ADDING CONFEREES TO A CONFERENCE

David F. Winchell, Glen Ellyn, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 16, 1982, Ser. No. 450,255

Int. Cl.[4] H04M *3/56*

U.S. Cl. 179—18 BC **10 Claims**



1. For use in a conference system comprising a multiport conference bridge, a method for activating a conference port on the bridge comprising the steps of

transmitting a signal to the bridge to alert other ports thereon that an additional one of said conference ports is about to be activated, and

activating said additional port independently of the control of said other ports at a predetermined time interval after the transmission of said signal.

4,550,225

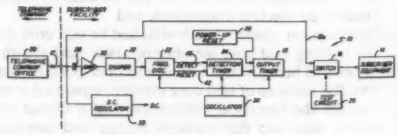
AC SIGNAL-ACTIVATED SWITCHING APPARATUS

Daniel Lynch, Jackson, and Steven B. Perry, Highlands, both of N.J., assignors to Keptel, Inc., Ocean, N.J.

Filed Oct. 31, 1983, Ser. No. 547,170

Int. Cl.[4] H04B *3/46*

U.S. Cl. 179—81 R **19 Claims**



1. Apparatus adapted to be coupled to a link such as a telephone line and the like and to equipment to connect or discon-

nect the equipment from the link in response to a signal transmitted on the link from a location remote from the location at which the apparatus is located, the apparatus comprising:

switch means adapted to be coupled to the link and to the equipment so as to connect and disconnect the link and the equipment in respective switch states of the switch means;

first means for detecting the presence for a predetermined minimum time period of a signal having a frequency within a first predetermined frequency range defined by a first predetermined lower frequency and a first predetermined higher frequency, said detecting means comprising means for counting pulses adapted to be coupled to the link and receive the signal from the link, said counting means producing an output signal when the number of pulses received by the counting means exceeds a first predetermined number within a first time period corresponding to said predetermined lower frequency and is less than a second predetermined number within a second time period which is greater than the first time period corresponding to said predetermined higher frequency, and further means coupled to the counting means for receiving the output signal from the counting means and providing an output signal when the number of output signals received from the first counting means is greater than a predetermined number within said predetermined minimum time period; and

means coupled to the detecting means to receive said output signal from said further means for causing the switch means to change state in response thereto.

4,550,226

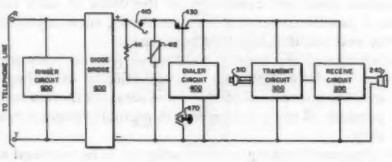
SUBSCRIBER'S TELEPHONE CIRCUIT ARRANGED TO PRESENT CONSTANT IMPEDANCE TO A TELEPHONE LINE

Albert G. Teater, Huntsville, Ala., assignor to GTE Communication Systems Corporation, Northlake, Ill.

Continuation-in-part of Ser. No. 490,932, May 2, 1983, abandoned. This application Sep. 7, 1984, Ser. No. 648,098

Int. Cl.⁴ H04M *1/60*

U.S. Cl. 179—81 R **7 Claims**



1. A subscriber's telephone circuit connected to a telephone line, comprising: transmit means including output circuit connections to said telephone line; receive means including input circuit connections from said telephone line and pulse dialing means connected to said telephone line; said dialing means, receiving means and transmit means each including fixed resistance means of selected specific values; and said fixed resistance means in said dialing means, said receiving means and said transmit means shunting said telephone line and in combination forming a constant AC impedance to said telephone line.

4,550,227

IN-THE-EAR HEARING AID

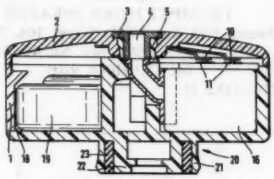
Christian Topholm, Vaerloese, Denmark, assignor to Topholm & Westermann I/S, Vaerloese, Denmark

Filed Jul. 9, 1984, Ser. No. 629,017

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1983, 3329473

Int. Cl.⁴ H04R *25/02*

U.S. Cl. 179—107 E **9 Claims**



1. An in-the-ear hearing aid for persons with impaired hearing, comprising: a generally flat cylindrical housing (**1**) adapted to be worn directly in the concha including a microphone, an amplifier, an earphone, a battery and a connector for an ear adapter, a cover (**2**) for said housing rotatable around a hollow shaft (**5, 6**) defining a sound inlet channel (**4**); said cover actuating an on/off switch (**8, 9**) and carrying, on an inner side thereof, at least one wiper (**10**) which, in contact with at least one resistive strip (**11**), which defines a volume control.

4,550,228

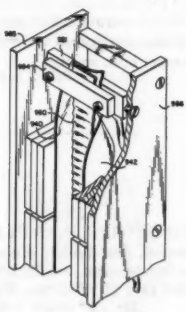
RIBBON SPEAKER SYSTEM

Gary E. Walker, Dover; Leo Spiegel; Anthony J. Shuman, both of Sharon, and James L. Kirtley, Jr., Brookline, all of Mass., assignors to Apogee Acoustics, Inc., Randolph, Mass.

Filed Feb. 22, 1983, Ser. No. 468,509

Int. Cl.⁴ H04K *9/06, 1/24, 7/06*

U.S. Cl. 179—115 V **25 Claims**



1. An electromagnetic transducer for reproducing sound vibrations comprising,

a non-vibrating frame,

a flexible, mechanically-corrugated ribbon comprised entirely of electrically-conducting materials, said ribbon having an elongated shape with a top and a bottom and means for defining a single, serpentine current path in said ribbon from said ribbon top to said ribbon bottom with a plurality of parallel legs having opposing current flow directions therebetween,

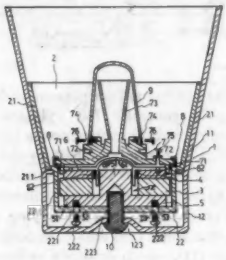
means for attaching said ribbon to said frame,

means for applying tension across said ribbon, and

means for establishing a magnetic field in the vicinity of said ribbon, said magnetic field interacting with the current in

said ribbon to cause audio-frequency vibrations of said ribbon.

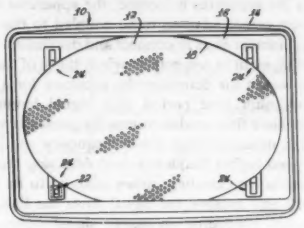
4,550,229
TRUMPET HORN SPEAKER
Shih M. Hwang, P.O. Box 7-369, Taipei, 106, Taiwan
Filed Sep. 29, 1982, Ser. No. 427,813
Int. Cl.[4] H04K *9/06*
U.S. Cl. 179—115.5 H **2 Claims**

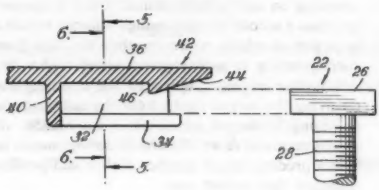


1. A trumpet horn speaker comprising:
a metallic heat sink,
a lower magnetic pole mounted on said heat sink,
a round permanent magnet connected to said lower magnetic pole,
an upper magnetic pole connected to said round permanent magnet,
a damping bracket mounted on said heat sink,
a plastic housing mounted on said heat sink;
whereby said plastic housing provides good waterproofing for said trumpet horn speaker and said metallic heat sink provides protection against overheating of the voice coil of said trumpet horn speaker.

4,550,230
SPEAKER GRILLE WITH SNAP-IN FASTENER SYSTEM
William K. Johnson, Fort Collins, Colo., assignor to International Jensen Incorporated, Schiller Park, Ill.
Filed Oct. 18, 1982, Ser. No. 435,085
Int. Cl.[4] H04R *1/02*
U.S. Cl. 179—178 **12 Claims**

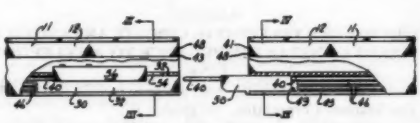
1. A loudspeaker grille mounting system comprising:
a. a loudspeaker grille;
b. a fastener which defines a head, a shank extending from said head, and at least one first surface; and
c. a head-receiving portion of said grille, said head-receiving portion secured to said loudspeaker grille and including a nest shaped to accommodate said head, said nest shaped to engage said first surface of said fastener to prevent rotation of said head, said head receiving portion further comprising a locking mechanism for retaining said head within said nest, said locking mechanism comprising an abutment and a latch spaced from said abutment, said abutment and latch being separated at least the dimension of said head received therebetween, said head receiving portion having at least one opening to permit insertion by sliding said head between said latch and abutment, said





latch, abutment and head cooperating to secure said head at a predetermined position with respect to said grille.

4,550,231
TROLLEY RAIL
Donald R. Ross, Sr., Pittsburgh, Pa., assignor to U-S Safety Trolley Corp., Pittsburgh, Pa.
Filed Sep. 22, 1983, Ser. No. 534,816
Int. Cl.[4] B60M *1/34, 1/24;* **H01R** *11/00*
U.S. Cl. 191—23 A **12 Claims**



1. In a pair of trolley rail sections wherein an end portion of an elongated electrical conductor of one such rail section is adapted to be connected to an adjacent end portion of an elongated electrical conductor of the other of such rail sections, a junction assembly for connecting such adjacent conductor end portions together comprising:
an elongated electrically conductive formed body member having defined therein a longitudinally extending open interior portion adapted to have retained therein such end portions of such conductors in mutually aligned relationship;
an elongated backing member adapted to be received within said open interior portion of said body member in juxtaposition to such end portion of one of such conductors;
clamping means cooperable with said body member for fixedly securing such end portion of such one conductor and said backing member within said open interior portion of said body member;
said backing member including a backup portion adapted to overlap such end portion of such one conductor and to cooperate with said clamping means for securing thereof within said open interior portion; said backing member including formed extension portion adapted to extend within said open interior portion beyond the extent of such end portion of such one conductor therein;

and said formed extension portion being cooperable with said body member to provide spring biased conductor guiding and securing means for retaining such end portion of the other of such conductors within said open interior portion in longitudinal alignment with the end portion of such one conductor fixedly secured therein.

12. A method of assembling a trolley rail conductor means into a trolley rail housing section comprising the steps of:

fixedly securing a conductor junction means to one end of an elongated conductor;

inserting the end of said elongated conductor opposite said one end into one longitudinal end of said housing section;

passing the entire length of said elongated conductor and said conductor junction means into said housing section;

during at least a terminal portion of said passing step, moving said elongated conductor to a misaligned orientation within said housing section to guide said conductor junction means into engagement with a conductor retention means;

and moving said elongated conductor to an aligned orientation coincident with the operative position thereof within said housing section to positively engage said conductor junction means with said conductor retention means for retention of said elongated conductor within said housing.

4,550,232

CIRCUIT BREAKER

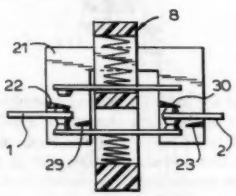
Helmut Lemmer, Marienheide, Fed. Rep. of Germany, assignor to Starkstrom Gummersbach GmbH, Marienheide, Fed. Rep. of Germany

Filed Jul. 18, 1983, Ser. No. 515,020

Claims priority, application European Pat. Off., Jul. 16, 1982, 82106410.2

Int. Cl.⁴ H01H *15/02*

U.S. Cl. 200—16 A **14 Claims**



1. An electric switching device, particularly a safety switch comprising a housing; and a contact system mounted in said housing and including contact bridges movable relative to said housing, stationary contact bars cooperating with the bridges to close or to open an electric circuit, a contact bridge carrier supporting two contact bridges and including means for resiliently pressing the bridges against opposite sides of the contact bars, and converting means movable relative to said housing between two positions and being engageable with at least a part of the contact system so that in one position the switching device operates as a circuit maker and in the other position as a circuit breaker, said converting means including a center piece mounted on said bridge carrier between said two bridges and being displaceable between a first position in which, in the rest position of said bridge carrier, both bridges are spaced apart from the contact bars so that the device operates as a circuit breaker, and a second position in which one of the bridges is spaced apart from the contact bars and the other bridge is in contact with the contact bars so that the device operates as a circuit maker.

4,550,233

Patent Not Issued For This Number

4,550,234

VACUUM CIRCUIT BREAKER WITH TWO SWITCHING TUBES CONNECTED IN SERIES FOR EACH POLE

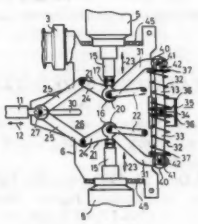
Norbert Steinemer, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany

Filed Jan. 5, 1984, Ser. No. 568,543

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1983, 3300979

Int. Cl.⁴ H01H *33/66*

U.S. Cl. 200—144 B **13 Claims**



1. In a vacuum circuit breaker having two switching tubes for each pole which are electrically connected in series and arranged substantially coaxial, a drive mechanism common to both switching tubes for closing and breaking the circuit, an offsetting drive unit for producing two motions that are contrary to one another from a uniform drive motion, and a contact pressure spring assigned to each switching tube, the improvement comprising:

(a) said contact pressure springs having a common support

mounted so that is can be moved along their line of action; and

(b) a lever system, connected with the free end of each contact pressure spring and with said offsetting drive unit, for transmitting the force of said spring to a drive tappet of each switching tube.

4,550,235

APPARATUS FOR RESTORING THE SURFACES SURROUNDING THE BORES OF METALLIC WORKPIECES

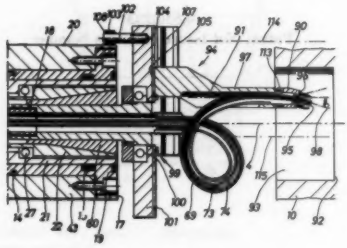
Peter Füwesi, Mosbacher Str. 13, D-6951 Schefflenz-U., Fed. Rep. of Germany

Filed Jul. 26, 1983, Ser. No. 517,347

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1982, 3228470

Int. Cl.[4] B23K *9/04*

U.S. Cl. 219—76.14 **20 Claims**



1. Apparatus for restoring a damaged surface surrounding a provided bore in a metallic workpiece, comprising a housing; a hollow shaft movable to a position of coaxiality with the bore and being axially movable but non-rotatably installed in said housing; a hollow spindle rotatably mounted in and arranged to share the axial movements of said shaft, said spindle being coaxial with said shaft and having a front end portion adjacent to the bore of the workpiece which is about to be repaired; a hollow first carrier separably mounted on the front end portion of and rotatable with said spindle; a welding tool mounted on said carrier and being inclined with reference to said spindle; a pipeline including a first pipe coaxial with and mounted in said spindle and a second pipe installed in said carrier and extending from said first pipe to said tool; and a flexible hose installed in said pipeline and arranged to surround a length of longitudinally movable welding wire extending to said tool.

4,550,236

GUN ARM APPARATUS FOR RESISTANCE WELDING GUN

Toshihiko Nakadate, Sayama, and Morikuni Numata, Ageo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Shibuya, Japan

Filed Dec. 22, 1983, Ser. No. 564,530

Claims priority, application Japan, Dec. 27, 1982, 57-195609[U]; Jan. 12, 1983, 58-1727[U]; Jan. 14, 1983, 58-2736[U]

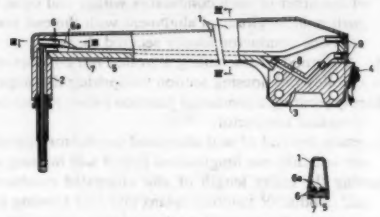
Int. Cl.[4] B23K *11/28*

U.S. Cl. 219—86.31 **7 Claims**

1. In a portable type resistance welder having two electrodes a gun arm apparatus extending to one of the two electrodes of the welder to carry a conductor of current to one of said electrodes and to carry a cooling medium for said conductor, which comprises:

(a) a main body means formed in a U-shaped cross section of relatively thin metal, having sides and an opening between the ends of the sides,

(b) an electrical conductor means disposed between the sides of the U near the ends of the sides in the form of a relatively thick plate member affixed to said body means along its longitudinal extent, and



(c) a cooling water passage means in contact with said electrical conductor and carrying cooling water to cool said electrical conductor and electrode.

4,550,237

WHEEL HUB UNIT ASSEMBLIES

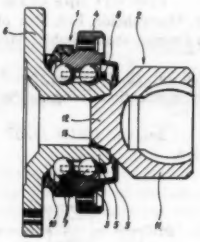
Boy Merkelbach, Utrecht, Netherlands, assignor to SKF Industrial Trading & Development Company B.V., Ab Nieuwegein, Netherlands

Continuation-in-part of Ser. No. 259,018, Apr. 30, 1981, abandoned. This application Oct. 13, 1983, Ser. No. 541,378

Claims priority, application Netherlands, May 9, 1980, 8002688

Int. Cl.[4] B23K *26/00, 15/00*

U.S. Cl. 219—121 LD **9 Claims**



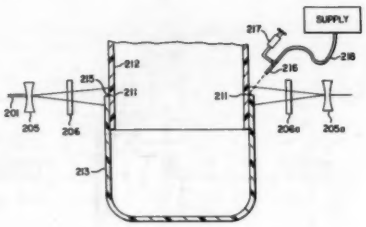
1. A method for joining a bearing assembly with an axially extending part of the outer element of a universal joint, the bearing assembly including an outer race, an inner race ring with opposite first and second ends and an axial bore therethrough and an attachment flange at said first end, and at least one annular row of rolling elements between said outer and inner races, the improvement comprising former a taper in said axial bore at said second end of said innter race to define a surface diverging in the axial direction toward said second end, forming said axially extending part of said outer element to define a tapered surface converging conically for conforming to and fitting in said axial bore at said tapered second end, inserting said tapered extending part into and adjacent to the surface of said tapered axial bore, and directing one of an electron and laser beam inward through said first end of said inner race to said second end and welding together with said beam said adjacent tapered surfaces of said extending part and second end respectively.

4,550,238

APPARATUS AND METHOD FOR SEALING CAPSULES

Louis Van Herle, Zandhoven, Belgium, and Fritz Wittwer, Lupsingen, Switzerland, assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Nov. 5, 1982, Ser. No. 439,514
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LC 30 Claims



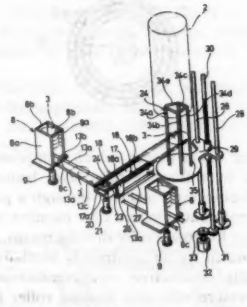
1. An apparatus for bonding hydrophilic polymer capsule elements which comprises
a source of coherent monochromatic radiation,
an assembled hydrophilic polymer capsule,
means to support said capsule,
means to direct a beam of said radiation at adjacent portions of said elements, and
means to control the amount of raidant energy absorbed by said portion of said elements,
whereby said adjacent portions are bonded.

4,550,239

AUTOMATIC PLASMA PROCESSING DEVICE AND HEAT TREATMENT DEVICE

Akira Uehara, Kanagawa; Isamu Hijikata, Tokyo; Hisashi Nakane, Kanagawa, and Muneo Nakayama, Tokyo, all of Japan, assignors to Tokyo Denshi Kagaku Kabushiki Kaisha, Kanagawa, Japan

Filed Sep. 27, 1982, Ser. No. 424,503
Claims priority, application Japan, Oct. 5, 1981, 56-159281; Aug. 27, 1982, 57-148583
Int. Cl.[4] B23K *9/00*; C23C *15/00*
U.S. Cl. 219—121 PG 17 Claims



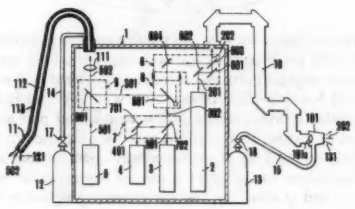
1. An automatic plasma processing device, comprising:
at least one cassette member adapted to contain a plurality of semiconductor wafers therein;
feeding means for taking out said wafers one by one from said cassette member and for feeding the same;
a holding member operable for receiving said wafers one by one from said feeding means and for holding a plurality of said wafers therein in a predetermined spaced relation in substantially the vertical direction, with each said wafer being disposed horizontally;
said holding member including a bottom plate, and a plurality of substantially vertical bars each having a lower portion thereof fixed to said bottom plate and grooves or slits formed in a vertical column therein, such that associated sets of grooves of said vertical bars may each receive therein peripheral portions of a wafer;
driving means for driving said holding member to move in a substantially vertical direction;
a plasma chamber disposed in a substantially vertical direction such that said holding member may be moved substantially in the vertical direction into and out of said plasma chamber;
plasma generating means for generating plasma in said plasma chamber in order to effect plasma processing of said wafers with the plasma generated thereby; and
control means for controlling said feeding means, said driving means and said plasma generating means in accordance with a predetermined sequence.

4,550,240

LASER IRRADIATING APPARATUS

Masahiro Toida, Kanagawa; Norihiro Suenaga, Tokyo, and Nobuyuki Suenaga, Kanagawa, all of Japan, assignors to Nippon Infrared Industries Co., Ltd., Tokyo, Japan

Filed Nov. 29, 1982, Ser. No. 445,186
Claims priority, application Japan, Sep. 21, 1982, 57-164338
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LS 11 Claims



1. A laser irradiating apparatus comprising a first laser source outputting a first laser beam, a second laser source outputting a second laser beam, said first beam being irradiated through a first light guide and said second laser beam being selectively irradiated through any one of said first light guide and a second light guide;
signal generating means for generating a first signal for indicating use of the first light guide and a second signal indicating use of the second light guide;
the first signal being generated when the first light guide is used and the second signal being generated when the second light guide is used;
first assist gas supply means for supplying a first assist gas to the first light guide when the first signal is input; and
second assist gas supply means for supplying a second assist gas to the second light guide when the second signal is input.

4,550,241

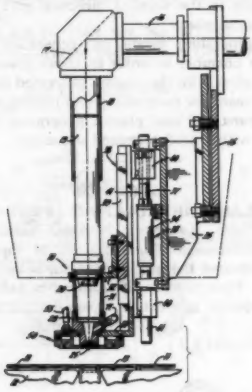
METAL MELTING TOOL WITH IMPROVED STAND-OFF MEANS

William B. Scott, Rochelle, and Bruce E. Ahmer, Rockford, both of Ill., assignors to W. A. Whitney Corp., Rockford, Ill.

Continuation of Ser. No. 388,278, Jun. 14, 1982, abandoned.
This application May 3, 1984, Ser. No. 606,573
Int. Cl.[4] B23K *26/00, 26/14*
U.S. Cl. 219—121 LG 5 Claims

1. Apparatus for cutting a substantially horizontal worksheet, said apparatus comprising a support, a metal melting tool

having a tip spaced above said worksheet and operable to emit downwardly directed energy and cutting gas for melting said worksheet, means mounting said tip and said worksheet for relative horizontal movement whereby to enable said tip to cut different areas of said worksheet, and means mounting said tip for up and down floating on said support to enable the elevation of said tip to be changed, the improvement in said apparatus comprising, a pneumatic bearing comprising a ring connected to said tool and encircling said tip, said ring having a lower surface spaced upwardly from said worksheet and formed with downwardly opening pad means which face said



worksheet, means for introducing pressurized gas into said pad means, the lower surface of said ring defining a narrow sill clearance adjacent said pad means and between said worksheet and said lower surface of said ring whereby said pressurized gas creates a pressurized cushion within said pad means and escapes at a controlled rate via said sill clearance to maintain said ring and said tip at a substantially constant spacing above said worksheet as the latter is moved horizontally relative to said tip, and at least one passage extending between the inner and outer sides of said ring above said sill clearance to permit said cutting gas to escape from said ring without any substantial flow of said cutting gas through said sill clearance.

4,550,242

AUTOMATIC PLASMA PROCESSING DEVICE AND HEAT TREATMENT DEVICE FOR BATCH TREATMENT OF WORKPIECES

Akira Uehara, Kanagawa; Isamu Hijikata, Tokyo; Hisashi Nakane, Kanagawa, and Muneo Nakayama, Tokyo, all of Japan, assignors to Tokyo Denshi Kagaku Kabushiki Kaisha, Kanagawa, Japan

Filed Sep. 27, 1982, Ser. No. 424,287

Claims priority, application Japan, Oct. 5, 1981, 56-159282; Aug. 27, 1982, 57-148583

Int. Cl.⁴ B23K *9/00*

U.S. Cl. 219—121 PG **22 Claims**

1. An automatic plasma processing device for processing a batch of semiconductor wafers, comprising:

at least one cassette member adapted to contain therein a batch including a plurality of said semiconductor wafers in a predetermined spaced relation in substantially the vertical direction;

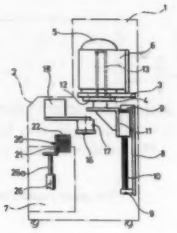
feeding means for feeding said cassette member from at least one predetermined position in which said wafers are loaded into said cassette member to a second predetermined position in which said wafers are taken out from said cassette member;

unloading means for simultaneously taking out said batch of semiconductor wafers in said predetermined vertically spaced relation from said cassette member placed at said second position;

a holding member operable for simultaneously receiving said batch of wafers from said unloading means and for holding said batch of semiconductor wafers therein in said predetermined vertically spaced relation;

driving means for driving said holding member to move in a substantially vertical direction;

a plasma chamber disposed in a substantially vertical direc-



tion such that said holding member may be moved in the vertical direction into and out of said plasma chamber;

plasma generating means for generating plasma in said plasma chamber in order to effect plasma processing of said batch of semiconductor wafers with the plasma thus generated; and

control means for controlling said feeding means, said unloading means, said driving means and said plasma generating means in accordance with a predetermined sequence.

4,550,243

HEAT ROLLER FIXING DEVICE

Sanji Inagaki, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 26, 1983, Ser. No. 545,492

Claims priority, application Japan, Nov. 4, 1982, 57-194218

Int. Cl.⁴ G03G *15/20*

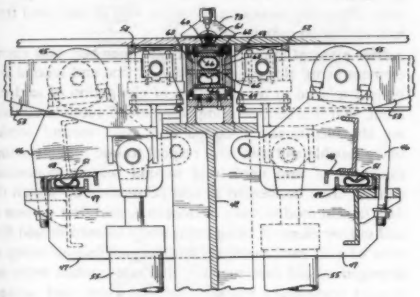
U.S. Cl. 219—216 **14 Claims**

1. A heat roller fixing device which comprises a heating roller constituted by a fluorine resin layer laminated on an electrically conductive core member through a primer layer, heating means incorporated in said core member, said heating roller being driven for rotation by driving means, and a pressure roller constituted by an electrically insulative layer on another electrically conductive core member and held in contact under pressure with said heating roller for simultaneous rotation with said heating roller, thereby fixing a charged toner image formed on copy paper onto the copy paper by causing said copy paper carrying said toner image thereon to pass between said heating roller and said pressure roller, said primer layer being composed of a primer having incorporated therein an electrically conductive material, the primer of said primer layer being partially exposed at an exposed outer surface of said fluorine resin layer.

4,550,244
LARGE PLATE ARC WELDER

John D. West; James E. Trainor, and James D. Karman, all of Manitowoc, Wis., assignors to The Manitowoc Company, Inc., Manitowoc, Wis.

Filed Sep. 28, 1983, Ser. No. 536,787
Int. Cl.[4] B23K *9/02*
U.S. Cl. 219—158 12 Claims

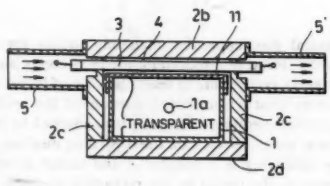


1. A welding machine for large plates comprising, in combination, a long rigid foundation member, a support channel fixed to the top of said foundation member and running the length of the weld to be made, a long rigid bridge mounted above and parallel to said foundation member, a track mounted on said bridge parallel to said support channel, a carriage carrying an arc welding assembly mounted for movement along said track, means for supporting plates on each side of said foundation member approximately the level of the top of said support channel, and means adjacent and along the length of said foundation member for securely holding the edge portions of a pair of plates against the top of said support channel so that the plate edges are spaced and parallel for welding by said assembly as it is moved down said track, said means for holding plates comprising a plurality of elongated electromagnets on opposite sides of said support channel together with means for raising and lowering the electromagnets into contact with the edge portions of a plate and pulling the plate firmly against the channel.

4,550,245
LIGHT-RADIANT FURNACE FOR HEATING SEMICONDUCTOR WAFERS

Tetsuji Arai, Kobe, and Hiroshi Shimizu, Yokohama, both of Japan, assignors to Ushio Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 29, 1983, Ser. No. 480,073
Claims priority, application Japan, Oct. 26, 1982, 57-186846
Int. Cl.[4] H05B *1/00;* F27D *11/02*
U.S. Cl. 219—405 6 Claims



1. A light-radiant furnace for heating semiconductor wafers comprising:

a container of predetermined shape made of a transparent material of high melting-point and adapted to have positioned therein an object to be treated, said container defining a gas intake port, a gas exhaust port and a plurality of outer surfaces;

a plurality of reflectors substantially surrounding said container in the proximity of the outer surfaces of the container so that they are disposed in a shape congruent to the shape of said container;

means for defining a space having opposite ends and being closed between said opposite ends, said space defining means including one of said outer surfaces of the container and an associated one of said reflectors;

an inlet air duct in communication with said space at one of said opposite ends and an outlet air duct in communication with said space at the other of said opposite ends;

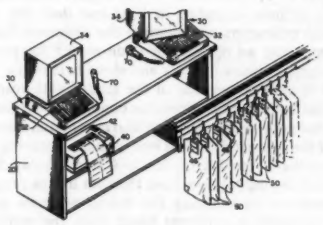
means associated with one of said air ducts for causing air to flow through said space in a predetermined direction from the inlet air duct to the outlet air duct; and

tubular lamps in said space parallel to and spaced from one another and parallel to said predetermined direction of air flow.

4,550,246
INVENTORY CONTROL AND REPORTING SYSTEM FOR DRYCLEANING STORES

Herbert Markman, 631 Fariston Dr., Wynnewood, Pa. 19096

Filed Apr. 13, 1984, Ser. No. 599,948
Int. Cl.[4] G06R *15/24*
U.S. Cl. 235—385 13 Claims



1. The inventory control and reporting system, comprising:

a data input device for manual operation by an attendant, the input device having switch means operable to encode information relating to sequential transactions, each of the transactions having articles associated therewith, said information including transaction identity and descriptions of each of said articles associated with the transactions;

a data processor including memory operable to record said information and means to maintain an inventory total, said data processor having means to associate sequential transactions with unique sequential indicia and to generate at least one report of said total and said transactions, the unique sequential indicia and the descriptions of articles in the sequential transactions being reconcilable against one another;

a dot matrix printer operable under control of the data processor to generate a written record of the indicia associated with sequential transactions, the written record including optically-detectable bar codes having a series of contrasting spaced bands, the bar codes being printed only in coincidence with each said transaction and at least part of the written record bearing a portion to be attached to said articles; and,

at least one optical scanner connected to the data processor and operable to detect said bar codes on all articles passing a predetermined station,

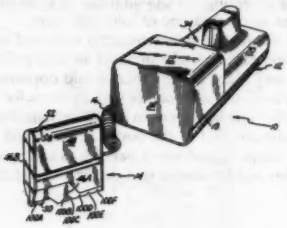
whereby said system can detect and localize spurious additions to inventory as well as spurious deletions therefrom.

4,550,247

OPTICAL SCANNING READER SYSTEM FOR LOADING COMPUTERS

Arthur J. Winter, Encino, Calif., and Rodney L. Larson, Minnetonka, Minn., assignors to Databar Corporation, Eden Prairie, Minn.

Filed Jan. 13, 1984, Ser. No. 570,674
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—472 **19 Claims**



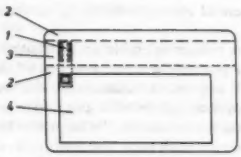
1. A system for loading prerecorded computer programs into a digital computer, the prerecorded computer program being recorded in the form of a plurality of lines of optical bar code, the plurality of lines including at least one Control Array line containing characters identifying the digital computer for which the program is written and defining a format for program data to be transmitted to the digital computer, and the plurality of lines including at least one data line containing additional characters representing the program data, the system comprising an optical bar code reader for providing an output representative of mark and space bars of the optical bar code as relative movement of the reader with respect to the optical bar code occurs, means for converting the output of the optical bar code reader for each line into digital data representative of the characters in that line, means for storing the digital data from the Control Array line as Control Array data, means for storing the digital data from the data line as program data, and means for transmitting the stored program data to the digital computer in a format based upon the stored Control Array data.

4,550,248

IDENTIFICATION CARD HAVING AN IC MODULE

Joachim Hoppe, and Yahya Haghiri-Tehrani, both of Munich, Fed. Rep. of Germany, assignors to GAO Gesellschaft für Automation und Organisation GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 356,800, Mar. 10, 1982, abandoned.
This application Aug. 2, 1984, Ser. No. 637,683
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1981, 3111516; Mar. 24, 1981, 8108609[U]
Int. Cl.[4] G06K *19/06*
U.S. Cl. 235—492 **6 Claims**



1. A standardized data card providing accessible electrically encoded data, said card comprising:

a rectangular card member of standardized length and width, said card member comprising a stratum of generally predetermined thickness, said card having at least first and second elongated zones lying generally parallel to the length of said rectangular card member, said zones extending along the entire length of said card member and occupying portions of the width of said card member, said first one of said zones being reserved for embossed indicia protruding above one side of said card to increase the overall thickness of the data card in excess of the thickness of said stratum, said second one of said zones being of the predetermined thickness of said stratum and having magnetic recording media on the other side of said card from said embossed indicia; and

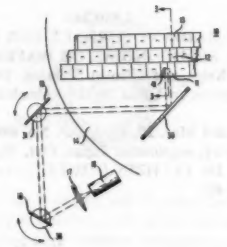
a carrier element applied to said card member, said carrier element being elongated and having first and second sections displaced in the direction of elongation of said element, said first section comprising an IC module containing the electrically encoded data, said second section being flexible and thin with respect to said predetermined thickness of said card, said second section containing contact areas connected to said IC module by which the data in said module may be accessed, said first section of said carrier element being completely located in said first zone of said card member, said second section being so arranged in said card member that said contact areas are located completely outside said first zone, said contact areas lying on the same side of said card member as the embossed indicia.

4,550,249

OPTICAL DISC READ/WRITE APPARATUS

Theodoor C. Damen, Colts Neck; Michael A. Duguay, Fair Haven; Richard E. Howard; Lawrence D. Jackel, both of Holmdel, and William J. Skocpol, East Windsor, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 21, 1983, Ser. No. 487,248
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—201 **10 Claims**



1. Optical disc apparatus including means for accessing information stored in a recording medium comprising:

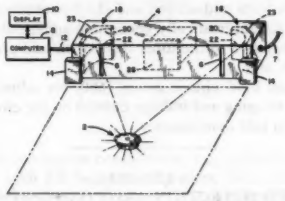
a first array comprising at least one row of lenses extending over at least a substantial portion of the width of the recording medium, with each lens adapted to focus light onto at least one track on the recording medium, and each lens extending in a tangential and radial direction with respect to the tracks on the recording medium; and

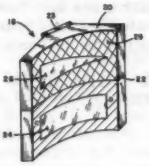
means for directing a light beam onto a desired track comprising at least one mirror which is mechanically manipulated to deflect the light beam onto a desired lens of the array.

4,550,250
CORDLESS DIGITAL GRAPHICS INPUT DEVICE

Wayne A. Mueller, Mound, and Scott D. Schuette, Loretto, both of Minn., assignors to HEI, Inc., Victoria, Minn.

Filed Nov. 14, 1983, Ser. No. 551,147
Int. Cl.[4] G08C 21/00
U.S. Cl. 250—203 R 13 Claims





13. A sensor system for producing positional coordinate data comprising:

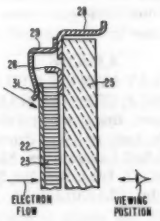
a cordless hand movable light source;

a detector module having an opaque screen and at least two parallel and spaced-apart transparent slits formed therein and through which planes of light from said source may pass, sensor means disposed behind said slits for detecting the intensities of the respective light planes relative to a reference and means responsive to each of said detected intensities for determining the angle of incidence of said light planes, whereby the positional coordinates of said light source relative to said detector module are determined.

4,550,251
IMAGE INTENSIFIER TUBE WITH INCREASED CONTRAST RATIO

Louis T. Zitelli, Palo Alto, and Richard T. Schumacher, Cupertino, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Jul. 8, 1983, Ser. No. 511,820
Int. Cl.[4] H01J 31/50
U.S. Cl. 250—213 VT 18 Claims



1. An image intensifier tube with improved contrast ratio, comprising:

a photocathode for emitting a flow of electrons,

a means for intensifying said flow of electrons,

an air-tight housing for containing an evacuated area,

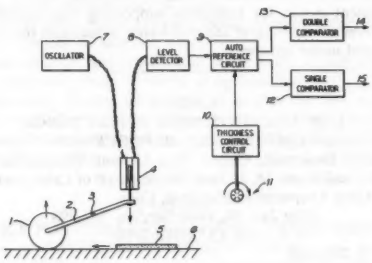
an output window plate which is transparent to light and forms a part of said air-tight housing, and

a fiber optic plate having a front surface with a phosphor layer which emits light when struck by said electrons and a back surface adjacent said output window, said fiber optic plate being entirely within said evacuated area.

4,550,252
APPARATUS FOR DETECTING THE THICKNESS OF SHEETS

Victor G. Tee, Havant, United Kingdom, assignor to De La Rue Systems Limited, London, England

PCT No. PCT/GB81/00237, § 371 Date Jul. 6, 1982, § 102(e) Date Jul. 6, 1982, PCT Pub. No. WO82/01698, PCT Pub. Date May 27, 1982
PCT Filed Nov. 7, 1981, Ser. No. 403,587
Claims priority, application United Kingdom, Nov. 7, 1980, 8035851
Int. Cl.[4] G06M 7/00
U.S. Cl. 250—223 R 10 Claims



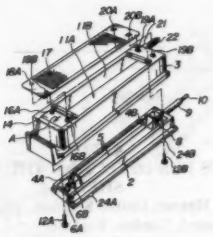
1. Apparatus for detecting the passage of single and multiple sheets (5) along a flow path, comprising: a surface (6) in the flow path for supporting the sheet or sheets; a follower (1 or 52) biased such that it normally abuts against the supporting surface and follows the profile of the supporting surface and the overlying sheet or sheets; a transducer (4 or 53) responsive to the position of the follower to provide a thickness signal (TP) indicative of the linear displacement of the follower relative to the supporting surface due to the passage of the sheet or sheets; a control circuit (FIGS. 3A, 3B) which compares the thickness signal (TP) with at least one stored threshold level signal to provide an output signal (31, 32, 33) indicative of whether the detected thickness corresponds to that of a single sheet or multiple sheets; the control circuit including: means (9) responsive to the transducer output signal in the absence of a sheet for repeatedly updating a stored no-sheet signal level; adjustable threshold level generating means (10) including adjustable means for generating first and second signals (TP1, TP2) which correspond to changes in the output of the transducer in response to the passage of a single sheet and two superimposed sheets, respectively; and means connecting the first and second signal generating means to the output of the updating means to add the updated no-sheet signal level to the first and second signals to obtain updated first and second threshold levels which will be exceeded by the output of the transducer in response to the passage of a single sheet and two superimposed sheets, respectively.

4,550,253

CORONA CHARGER OF SCOROTRON TYPE

Tatsutoshi Hashimoto, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Apr. 18, 1983, Ser. No. 486,020
Claims priority, application Japan, Apr. 20, 1982, 57-57265
Int. Cl.⁴ H01T *19/00*; **G03G** *15/02*
U.S. Cl. 250—326 **13 Claims**



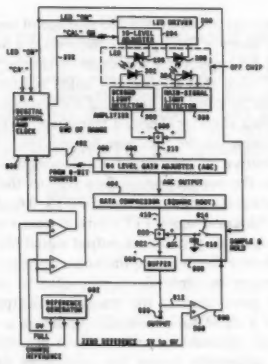
1. A corona charger of the scorotron type comprising a base frame;
a corona wire secured to the base frame;
a grid frame secured to the base frame in an easily removable manner;
a control grid removably secured to the grid frame and in insulated relationship to said corona wire; and
resilient means for resiliently supporting the control grid over the opening of the grid frame to maintain the control grid under tension.

4,550,254

LOW COST INFRARED REFLECTANCE DENSITOMETER SIGNAL PROCESSOR CHIP

Mehrdad Zomorrodi, Culver City; Li-Fung Cheung, Los Angeles, and Simon M. L. Law, Torrance, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 16, 1984, Ser. No. 571,393
Int. Cl.⁴ G01J *1/00*
U.S. Cl. 250—338 **11 Claims**



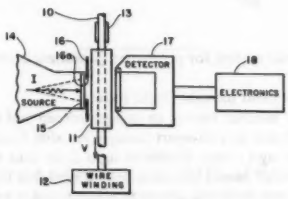
1. An infrared reflectance densitometer for detecting relative toner density on a photoreceptive surface comprising:
infrared light emitting diode means (**206**) for emitting light toward said surface,
first photodiode detection means (**208**) adjacent said light emitting diode means and positioned for receiving, monitoring and controlling the direct light output therefrom,
second photodiode detection means (**302**) adjacent said light emitting diode means and positioned for receiving and detecting only the scattered and reflected light from the background, excluding said surface,
third photodiode detection means (**304**) adjacent said light emitting diode means and positioned for receiving and detecting only the light reflected from said surface as may be affected by toner deposited thereon,
automatic gain control circuit means (**400**) for receiving the outputs from said second and third photodiode detection means for automatically generating an output signal (**630**) representative of the toner density on said photoreceptor surface, and
sample and hold circuit means (**600**) for adjusting for the effects of aging and leakage current on the circuit components on said densitometer.

4,550,255

VOID DETECTION AND COMPOSITION MEASUREMENTS IN COMPOSITE WIRES

Charles Sve, Palos Verdes Estates, and Eric P. Muntz, Pasadena, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 5, 1983, Ser. No. 511,060
Int. Cl.⁴ G01N *23/18*
U.S. Cl. 250—359.1 **16 Claims**



1. Apparatus for the nondestructive inspection of wire, comprising:
a. a source of penetrating radiation;
b. a fluid bath for immersing said wire disposed adjacent said source, said bath comprising a material having a coefficient of attenuation of said penetrating radiation substantially equal to that of the material of said wire, said bath further configured to provide first and second paths for said penetrating radiation defined through said bath, said second path defined through said wire and surrounding bath material, said first and second paths having substantially identical path lengths; and
c. a detector means for separately detecting the intensities of penetrating radiation transmitted, respectively, along said first and second paths, and for providing respective output signals porportional thereto.

4,550,256

VISUAL DISPLAY SYSTEM UTILIZING HIGH LUMINOSITY SINGLE CRYSTAL GARNET MATERIAL

George W. Berkstresser, Bridgewater; Tai-Chan D. Huo, and Joseph Shmulovich, both of New Providence, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

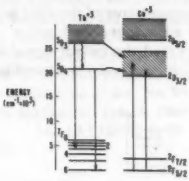
Filed Oct. 17, 1983, Ser. No. 542,391
Int. Cl.⁴ G01J *1/58*
U.S. Cl. 250—483.1 **14 Claims**

1. Visual display apparatus comprising
(a) an excitation beam source, the beam selected from the group consisting of electron beams and beams of electromagnetic radiation comprising UV radiation,
(b) a screen comprising single crystal phosphor material, the beam caused to be incident on the screen, and

(c) means for deflecting the beam, and means for amplitude modulating the beam,

CHARACTERIZED IN THAT

(d) the phosphor material comprises single crystal material



essentially having the composition $Y_{3-x-y-z}Ce_xTb_yRE_zAl_{5-w}X_wO_{12}$, with RE being one or more rare earths of the 4f-type, other than Y, Ce, and Tb, X is selected from the group consisting of Sc, Ga, and In, $0<x\leqq0.06$, $0<y\leqq0.5$, $0\leqq z\leqq2$, and $0\leqq w\leqq3$, wherein Tb acts as sensitizer.

4,550,257

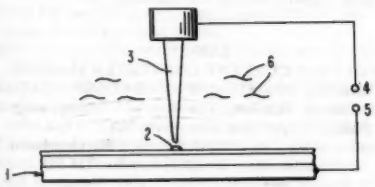
NARROW LINE WIDTH PATTERN FABRICATION

Gerd K. Binnig, Richterswil, Switzerland; Randall M. Feenstra, Tarrytown; Rodney T. Hodgson, Ossining, both of N.Y.; Heinrich Rohrer, Richterswil, Switzerland, and Jerry M. Woodall, Bedford Hills, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1984, Ser. No. 626,178

Int. Cl.⁴ H01J *37/317*

U.S. Cl. 250—492.2 **4 Claims**



1. Apparatus for forming a line of a material on a substrate comprising in combination

a pointed stylus,

a substrate,

an electric current decomposable gas,

means providing current flow between said stylus and said substrate through said gas,

means including interdependent voltage, point radius, and point to substrate separation parameters for adjusting said current flow to provide quantum mechanical tunneling at a field energy value essentially matched to the energy required to dissociate the molecules of said gas.

4,550,258

APERTURE STRUCTURE FOR CHARGED BEAM EXPOSURE

Fujio Omata, Hachioji, and Kiichi Takamoto, Tokorozawa, both of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Jul. 19, 1983, Ser. No. 515,304

Claims priority, application Japan, Jul. 27, 1982, 57-130616; Feb. 1, 1983, 58-15146

Int. Cl.⁴ H01J *37/00*

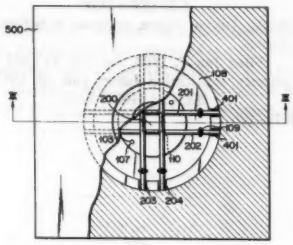
U.S. Cl. 260—505.1 **28 Claims**

1. An aperture structure for a charged particle beam exposure apparatus which includes an electron optical system having an optical axis, said aperture structure comprising:

an electrically conductive sheet having an opening therein, said opening having straight edges;

a base having a plurality of pins projecting therefrom, said base being disposed on said optical axis of said electron optical system of said charged particle beam exposure apparatus and having an opening therein opposed to said opening of said conductive sheet for passing a charged beam therethrough; and

fine wires stretched between respective pins of said base, said fine wires having side edges which are individually located inside at least two adjacent sides of the opening of



the conductive sheet, said fine wires defining an opening smaller than the opening of the conductive sheet, said opening defined by said fine wires defining the cross-section of the charged particle beam;

said electrically conductive sheet being disposed adjacent at least one side of said fine wires;

said opening of said conductive sheet being a polygonal opening one corner of which is right-angled; and

said plurality of pins being located so that the fine wires thereon define the sides of the aperture corresponding to the individual sides of said polygonal opening of said conductive sheet.

4,550,259

DEVICE FOR CONVERTING WIND ENERGY INTO ANOTHER FORM OF ENERGY

Augustinus W. M. Bertels, Arnhem, Netherlands, assignor to Transinvest B.V., Almere, Netherlands

Filed Jul. 20, 1983, Ser. No. 515,524

Claims priority, application Netherlands, Jul. 28, 1982, 8203019

Int. Cl.⁴ F04D *29/38*

U.S. Cl. 290—55 **14 Claims**

1. A device for converting wind energy to mechanical energy, which comprises a rotatable driving shaft adapted to provide energy output, a propeller having a plurality of blades radiating from said shaft, each blade being of airfoil shape in cross section to define a rounded leading edge and a tapered trailing edge, each blade having an axis defined by the locii of points lying at the one quarter points of the chords of the airfoil which axis is curved from the root of the blade toward the tip

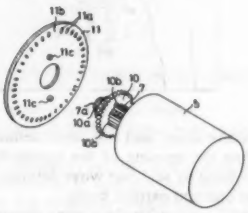
in the direction of rotation, and the tip portion of each blade being displaced outwardly from the general plane of rotation in the direction of incident wind and said propeller having a power coefficient which does not become negative for any ratio $\lambda=\Omega R/V$ where Ω is the angular velocity of the propeller expressed in radians per second, R is the radius of the propeller in meters, and V is the wind velocity in meters per second.

4,550,260

APPARATUS FOR CONTROLLING A PULSE GENERATOR

Yoshiaki Ikeda, Tokyo, Japan, assignor to Seikosha Co., Ltd., Tokyo, Japan

Filed Jun. 7, 1984, Ser. No. 617,961
Claims priority, application Japan, Jun. 10, 1983, 58-103806
Int. Cl.[4] H03K *3/00*
U.S. Cl. 307—106 **3 Claims**



1. An apparatus for controlling a pulse generator, comprising:
- a sensor cooperating with a rotary detecting plate for generating a pulse;
- an indexing gear facing one side of said detecting plate and comprised of a rotary member on which said detecting plate is supported;
- a plurality of indexing pins provided on said one side of said detecting plate and engaged with teeth on said indexing gear, said pins being disengageable from said teeth and engageable with different teeth on said indexing gear by rotation of said detecting plate relative to said indexing gear; and
- a spring urging said detecting plate in engagement with said indexing gear.

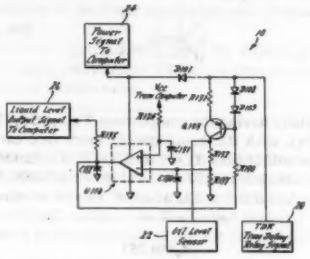
4,550,261

FLUID LEVEL SENSOR CIRCUITRY

Ronald F. Hormel, Mt. Clemens, and Frederick O. R. Miesterfeld, Troy, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Sep. 19, 1983, Ser. No. 533,181
Int. Cl.[4] G01F *23/22*; H01H *47/32*
U.S. Cl. 307—118 **4 Claims**

1. A fluid level sensor circuit comprising:
relay means to supply power to the circuit;
a fluid level sensor which employs semiconductive material which, over a temperature range, exhibits a predetermined varying resistance which is governed by a negative temperature coefficient over at least part of the temperature range;
constant current means connected to the relay means and connected to supply a constant current to the fluid level sensor, the constant current means comprising;
a transistor to pump current out of its collector to the fluid level sensor;
an emitter resistor connected between the relay means and the emitter of the transistor; and
two diodes connected in series between the relay means and the base of the transistor whereby the voltage across the emitter resistor is held to one diode drop and the current through the emitter resistor is held constant;
reference voltage means;
a signal representative of the fluid level sensor output;
comparator means to compare the reference voltage means to the signal representative of the fluid level sensor output and to generate an output signal; and
feedback means to feed the output signal back to the constant current source whereby the condition of the output



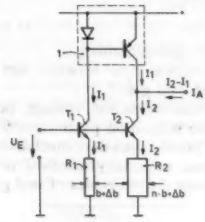
signal determines when to energize and de-energize the constant current means; the feedback means comprising:
a resistor connected between the output of the comparator and the base of the transistor whereby the voltage at the base is: pulled down towards ground when the output of the comparator is low, thereby turning the transistor on, and pulled up towards the start signal generating means voltage when the output of the comparator is high, thereby turning the transistor off.

4,550,262

VOLTAGE-CURRENT CONVERTER HAVING REFERENCE RESISTOR SPREAD COMPENSATION

Cord H. Kohsiek, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 439,141, Nov. 4, 1982, abandoned. This application Mar. 26, 1985, Ser. No. 716,519
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1982, 3213838
Int. Cl.[4] H03K *3/26*; G05F *3/08*
U.S. Cl. 307—260 **6 Claims**



1. An integrated substantially linear voltage-current converter circuit for generating an output current, which produces a voltage drop across a first reference resistor, which voltage drop is determined by an input voltage, comprising means for compensating for the spread in resistor width by generating a second current in a circuit branch which is arranged in parallel with said first reference resistor, which second current produces a voltage drop, which voltage drop is determined by the input voltage across a second resistor which is arranged in the circuit branch, which has the same resistance per unit area, the same length, and a different width than that of the first resistor, and means for generating said output cur-

rent as a function of the difference between the currents flowing through said first and second reference resistors.

4,550,263

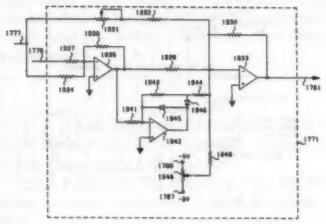
WAVEFORM GENERATOR

James E. Layton, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 305,291, Sep. 24, 1981, Pat. No. 4,443,713, which is a division of Ser. No. 105,041, Dec. 18, 1979, Pat. No. 4,305,274, and a continuation of Ser. No. 955,843, Oct. 30, 1978, abandoned. This application Feb. 3, 1984, Ser. No. 576,980

Int. Cl.⁴ H03K *4/08*

U.S. Cl. 307—261 **2 Claims**



1. Apparatus for generating a sawtooth waveform comprising:

means for generating a triangular waveform;

summing means having first and second inputs and an output;

means for supplying said triangular waveform to said first input of said summing means;

means for supplying said square waveform to said second input of said summing means;

a full wave rectifier means having first and second inputs and an output;

means for supplying the output of said summing means, representative of the summation of said triangular waveform and said square waveform, to said first input of said full wave rectifier means; and

means for supplying said space waveform to said second input of said full wave rectifier means, said sawtooth waveform being supplied from the output of said full wave rectifier means.

4,550,264

BOOSTING CIRCUIT

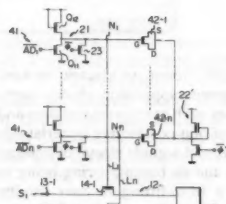
Hitoshi Takahashi, Yokohama; Satoru Yamaguchi, and Hideo Nunokawa, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 30, 1983, Ser. No. 480,585

Claims priority, application Japan, Mar. 31, 1982, 57-51148

Int. Cl.⁴ H03K *3/57, 5/02*

U.S. Cl. 307—264 **6 Claims**



1. A boosting circuit for generating a boosted voltage at one of a plurality of output terminals in response to selection signals, comprising:

a plurality of variable capacitors each having first and second terminals, said first terminals respectively connected to the output terminals, and each of said variable capacitors having a capacitance which is variable in accordance with the voltage between its first and second terminals;

first buffer circuits, respectively, operatively connected to said variable capacitors, for selectively providing a first potential at one of said first terminals in response to the selection signals at a first timing, the first potential being higher than the potential at the other said first terminals; and

a second buffer circuit, operatively connected to said second terminals, for boosting the potential at said second terminals at a second timing which occurs after said first timing, thereby selectively boosting the first potential at said one of said first terminals to generate the boosted voltage.

4,550,265

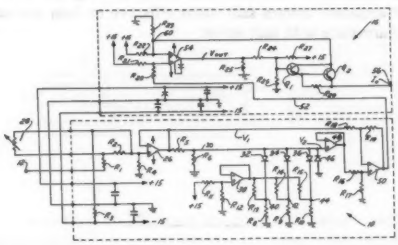
DRIVER FOR VOLTAGE CONTROLLED ATTENUATOR

Novellone Rozario, Jericho, and Lawrence H. Silverman, Dix Hills, both of N.Y., assignors to General Instrument Corp., Clifton, N.J.

Filed Sep. 13, 1982, Ser. No. 416,863

Int. Cl.⁴ G06G *7/12*

U.S. Cl. 307—494 **17 Claims**



1. Apparatus for generating an output signal which is a non-linear function of an input signal, for use with a reference signal source, comprising: input means for receiving an input signal of a first magnitude, said input means having an output; means for forming a signal of a second magnitude which is a non-linear function of the input signal, said non-linear signal forming means comprising means, responsive to the signal level at said input means output and effective, when actuated by a signal level exceeding a preselected magnitude, for operably connecting said output of said input means and the reference signal source; and means for forming a signal which is a function of the difference between said first and said second magnitude, said difference signal comprising said output signal, said connecting means comprising resistance means, means having a first terminal operably connected to said output of said input means, and a second terminal operably connected to the reference signal source through said resistance means, and being adapted to become conductive when the potential at said first terminal and the potential at said second terminal are in a given relationship, and wherein said apparatus further comprises means for establishing the potential at said second terminal.

4,550,266

RECIPROCATING ARMATURE MOTOR FOR DRIVING ELECTRICAL EQUIPMENT

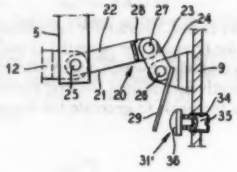
Ewald Kille, and Heinrich Griebel, both of Friedrichshafen, Fed. Rep. of Germany, assignors to J. Wagner GmbH, Fed. Rep. of Germany

Filed Feb. 21, 1984, Ser. No. 581,806

Claims priority, application European Pat. Off., Jan. 21, 1984, 84100633.1

Int. Cl.⁴ H02K *33/00*

U.S. Cl. 310—19 **19 Claims**



1. An reciprocating armature motor to electrically drive equipment, in particular for use in driving piston pumps of paint spray guns, diaphragm compressors and the like, said motor having a stator holding a solenoid, an armature being pivotally mounted at one end to the stator and having a second end acting upon a member of the equipment to be actuated to move the member back and forth along a path when the armature moves relative to the stator with a reciprocating motion, and means for controlling the reciprocating motion of the armature including means for forming a positive link between the armature and a stationary element including a coupling link, which varies in its movement depending upon the reciprocations of the armature, said means limiting movement of said armature toward said stator effective to limit contact of said armature with said stator.

4,550,267

REDUNDANT MULTIPLE CHANNEL ELECTRIC MOTORS AND GENERATORS

Jayant G. Vaidya, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

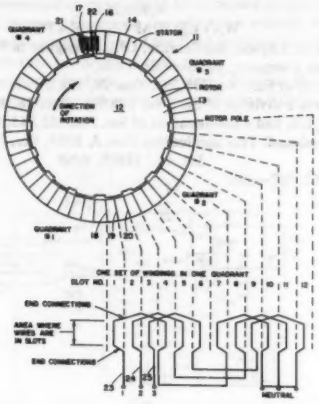
Continuation of Ser. No. 467,685, Feb. 18, 1983, abandoned. This application Jun. 14, 1985, Ser. No. 744,887

Int. Cl.⁴ H02K *3/00*

U.S. Cl. 310—184 **38 Claims**

1. An electromotive machine of the type having a stator and a rotor;

said stator being provded with multiple sets of windings each independently electrically coupled to an electrical means with each set of windings simultaneously independently, transfering multiphase power between said electrical means and each set of windings to thereby establish separate power channels that allow for the simultaneous



independent transmission of power through said channels when said machine is in operation.

4,550,268

BRUSH MOUNTING ON ELECTRIC MOTORS EQUIPPED WITH RADIO-INTERFERENCE SUPPRESSION CHOKES, PARTICULARLY FOR HOUSEHOLD APPLIANCES SUCH AS VACUUM CLEANERS OR THE LIKE

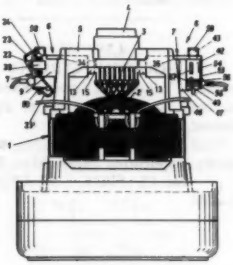
Dietmar Becker, Radevormwald, and Klaus-Dieter Wilcke, Gevelsberg, both of Fed. Rep. of Germany, assignors to Vorwerk & Co. Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Filed May 27, 1983, Ser. No. 499,092

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1982, 3220877

Int. Cl.⁴ H02K *13/00*

U.S. Cl. 310—239 **20 Claims**



1. In a brush mount on electric motors equipped with a radio-interference suppression choke, particularly for household appliances such as vacuum cleaners and the like, having a support part of non-conductive material which is mounted on a motor frame, and a guide sleeve of conductive material for a carbon brush and its biasing spring being inserted in the support part in a form-fitting manner axially non-displaceably between two side walls extending from a web of the support part, the support part and said web thereof have a length in the same direction as the length of the carbon brush and the guide sleeve, the rear end of the guide sleeve having a connection lug for a conductor of the carbon brush, the improvement wherein

the side walls extend substantially the entire length of the web and define free edges of the side walls,

a cover means for fixing the guide sleeve in its inserted position in the support part without vibration, said cover means is mounted on the free edges of the side walls,

the web of the support part forms wing portions which respectively project outwardly beyond said side walls, said wing portions include resting surfaces for mounting of the support part on the motor frame,

spring means for spring-biasing said mounting of the support part on the motor frame,

a plug-type distribution plate positioned on said support part,

an end portion of the support part outwardly beyond said side walls being formed with respective opening means themselves for holding the radio-interference suppression choke and for holding said plug-type distribution plate, respectively.

4,550,269

ELECTRIC DISCHARGE LAMPS

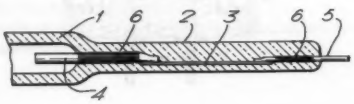
Angus B. Dixon, Lancashire, England, assignor to The General Electric Company, p.l.c., England

Filed Oct. 31, 1983, Ser. No. 546,813

Claims priority, application United Kingdom, Feb. 4, 1983, 8303074

Int. Cl.[4] C03C *29/00*; A47B *88/00*

U.S. Cl. 313—331 **15 Claims**



1. A high pressure electric discharge lamp comprising a discharge envelope of fused silica containing a discharge supporting filling, a pair of electrodes between which an electric discharge passes in operation of the lamp, each said electrode comprising or being supported by a refractory metal rod and, at at least one end of the envelope, a further refractory metal rod projecting from said end of the envelope to provide an external lead and a strip of refractory metal foil extending between and connected electrically to the electrode rod and associated lead rod, wherein the improvement comprises:

at least one coil of relatively thin refractory metal wire wound tightly around a region of a respective electrode rod and/or associated lead rod, adjacent turns of the wire of the coil being in contact with one another or separated by a distance which is less than the diameter of the wire, the metal foil strip and at least a part of that region of a said rod which is surrounded by the wire coil being firmly embedded in a pinch seal at said end of the envelope, with the envelope material pressed tightly around said region of the rod.

4,550,270

TUNGSTEN HALOGEN LAMP HAVING A FINE-WIRE FILAMENT AND A HYDROGEN-IMPERVIOUS ENVELOPE

Stephen F. Kimball, No. Andover; Emery G. Audesse, Beverly, and Robert M. Griffin, So. Hamilton, all of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed May 2, 1983, Ser. No. 490,603

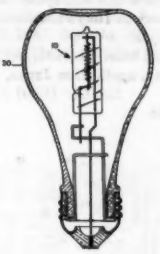
Int. Cl.[4] H01K *1/08*

U.S. Cl. 313—579 **4 Claims**

1. A tungsten-halogen lamp comprising:

(a) an envelope enclosing a hermetically sealed cavity, said envelope being impervious to hydrogen;

(b) a fine-wire filament comprising tungsten operatively mounted within said hermetically sealed cavity, said fine-wire filament having a diameter of approximately 0.003 inches or less; and



(c) a fill within said hermetically sealed cavity, said fill comprising a halogen and hydrogen.

4,550,271

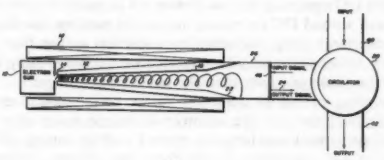
GYROMAGNETRON AMPLIFIER

Yue-Ying Lau, Silver Spring, Md., and Larry R. Barnett, Manassas, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 23, 1983, Ser. No. 507,258

Int. Cl.[4] H01J *25/00*

U.S. Cl. 315—4 **12 Claims**



1. A method for efficiently amplifying radiation at millimeter wavelengths in a gyromagnetron waveguide tube comprising the steps of:

choosing a waveguide tube with longitudinally running vanes in the walls of the tube, with the number of vanes in the tube chosen to coincide with the number of a desired cyclotron harmonic to be amplified, and wherein the dimensions for the tube cross-section are chosen so that the desired cyclotron harmonic frequency is approximately equal to the cut-off frequency of a fundamental mode of the waveguide tube;

generating a magnetic field within said waveguide tube in a direction approximately parallel to the axis of said waveguide tube with a value appropriate to the cyclotron harmonic frequency chosen for amplification;

generating and directing a beam of spiralling mildly relativistic electrons with an energy of 100 keV or less into said waveguide tube to propagate longitudinally therein and to interact with the fringe electric fields set up between the vanes; and

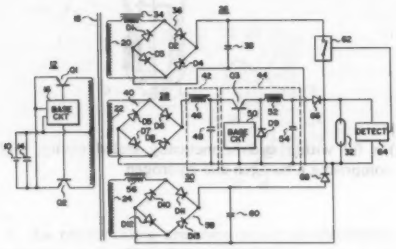
launching electromagnetic energy to be amplified into said waveguide tube to co-propagate with the spiralling electron beam.

5. A method as defined in claim 1, wherein the number of vanes is greater than two.

4,550,272
OPERATING CIRCUIT FOR ELECTRIC DISCHARGE LAMP

Mitsutoshi Kimura, and Masayuki Morita, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 20, 1984, Ser. No. 591,480
Claims priority, application Japan, Mar. 30, 1983, 58-52676
Int. Cl.⁴ H05B *37/00*
U.S. Cl. 315—86 **6 Claims**



1. Operating circuit for an electric discharge lamp comprising:

first DC operating means for supplying a DC output voltage higher than a rated lamp voltage to said electric discharge lamp to start the electric discharge lamp and for making the electric discharge lamp operative by a current smaller than a rated lamp current;

second DC operating means, connected in parallel to said first DC operating means, for making said electric discharge lamp operative by a voltage near the rated lamp voltage and by a current near the rated lamp current;

third DC operating means, connected in parallel to said first and second DC operating means, for making the electric discharge lamp operative by a current larger than said rated lamp current when the electric discharge lamp has a lamp voltage lower than the rated lamp voltage;

switching means for detecting the predetermined electrical characteristic of the electric discharge lamp after the electric discharge lamp has started, and for cutting off said first DC operating means from the electric discharge lamp;

first reverse current preventing means, connected in series to said second DC operating means, for preventing the current from reversely flowing from said first DC operating means to said second DC operating means; and

second reverse current preventing means, connected in series to said third DC operating means, for preventing the currents from reversely flowing from said first and second DC operating means to said third DC operating means.

4,550,273
EIGHT ELECTRODE OPTICAL READOUT GAP

Gordon E. Boettcher, and Robert W. Crain, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Apr. 25, 1983, Ser. No. 488,338
Int. Cl.⁴ H05B *37/02, 39/04, 41/36*
U.S. Cl. 315—151 **17 Claims**

1. A protective device for monitoring a pair of electrical connectors comprising:

a housing comprising an electrically insulating envelope;

first and second spaced electrode means connected to the connectors to be protected and forming a discharge gap within said housing;

discharge means within said housing for discharging responsively to a predetermined voltage across said discharge gap between said first and second electrode means;

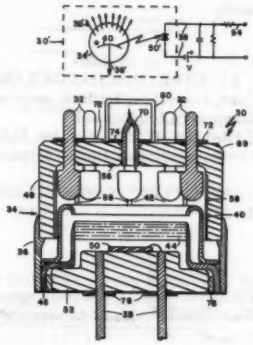
dynamic starter means adjacent said gap for initating a fast rise time discharge within said gap, said means comprising a groove adjacent said electrode means in an inner surface of said envelope and a pair of metalized strips on opposite sides of said groove; and

optical detecting means for detecting said discharge between said first and second electrode means and including output means for providing an output signal indicative of said discharge;

said detecting means being electrically isolated from said electrode means.

2. A protective device for monitoring a plurality of electrical connectors comprising:

a housing;



a plurality of electrically isolated electrode means passing through said housing for connection to the electrical connectors to be protected;

a common electrode means forming a discharge gap with each of said plurality of electrode means;

discharge means within said housing for discharging responsively to a predetermined discharge voltage across said discharge gap between said common electrode means and any of said plurality of electrode means; and

optical detecting means for detecting said discharge between said common electrode means and any of said plurality of electrodes and including output means for providing an output signal indicative of said discharge;

said detecting means being electrically isolated from the electrode means within the housing.

4,550,274
MOSFET SUSTAINER CIRCUIT FOR AN AC PLASMA DISPLAY PANEL

Larry F. Weber, Champaign, Ill., assignor to Interstate Electronics Corporation, Anaheim, Calif.

Continuation of Ser. No. 549,212, Nov. 4, 1983, abandoned, which is a continuation of Ser. No. 258,757, Apr. 29, 1981, abandoned. This application Oct. 3, 1984, Ser. No. 657,464
Int. Cl.⁴ H05B *37/00;* **G09G** *3/28*
U.S. Cl. 315—169.4 **17 Claims**

1. A sustainer for an AC plasma panel, said sustainer comprising:

a pull-up switch connected to a first voltage potential;

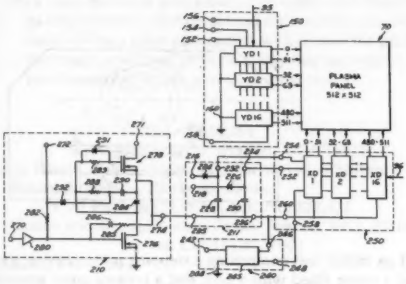
a pull-down switch connected to a second voltage potential, said second voltage potential lower than said first voltage potential;

an output for said sustainer, said output coupled to said pull-up switch and driven to said first voltage potential when said pull-up switch is conductive, said output additionally coupled to said pull-down switch and driven to

said second voltage potential when said pull-down switch is conductive;

driving means for selectively, alternatively closing said pull-up and pull-down switches;

connecting means for connecting said driving means to said pull-up and pull-down switches to prevent both of said switches from being closed simultaneously; and



first control means reduce the rate at which is potential of said sustainer output changes from said first potential to said second potential to a rate effective to eliminate excessive displacement currents;

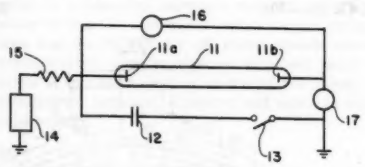
wherein said pull-up and pull-down switches are MOSFET transistors.

4,550,275

HIGH EFFICIENCY PULSE ULTRAVIOLET LIGHT SOURCE

James P. O'Loughlin, Albuquerque, N. Mex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 7, 1983, Ser. No. 539,889
Int. Cl.⁴ H05B *41/19*
U.S. Cl. 315—241 R **6 Claims**



1. A high intensity pulsed ultraviolet light source comprising:

a. a low pressure noble gas filled flashlamp having a pair of electrodes for supporting a discharge therebetween through said gas;

b. a low impedance pulse forming circuit connected to said flashlamp, said circuit including a series connected switch and capacitor operatively connected to said electrodes;

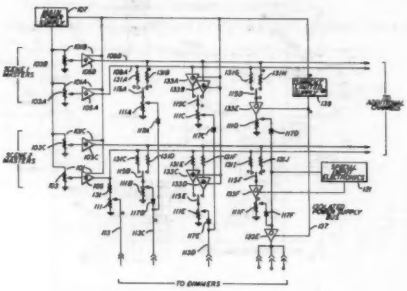
c. a high voltage source and lamp resistance operatively connected to one of said electrodes for imposing a high electric field within said gas between said electrodes prior to said discharge.

4,550,276

BUSS STRUCTURES FOR MULTISCENE MANUAL LIGHTING CONSOLES

Michael Callahan, 201 W. 85th St., New York, N.Y. 10024, and Robert M. Goddard, 330 First Ave., New York, N.Y. 10009

Filed Jun. 14, 1982, Ser. No. 388,230
Int. Cl.⁴ H05B *37/00, 39/00, 41/00*
U.S. Cl. 315—312 **39 Claims**



1. In a lighting console providing outputs to dimming means, said console including:

(a) master controls for at least two scenes; and

(b) channel controls for each of a plurality of channels, said channel controls including at least a first and second scene preset potentiometer, said channel controls and said master controls cooperating to allow presetting;

(c) a buss;

(d) one of said preset potentiometers for each of a plurality of channels connected to said buss;

(e) means for driving said buss, said means for driving having an input coupled to one of said master controls, the improvement comprising:

(f) a plurality of nondestructively current-limiting fault isolating means for each scene, each connected between said master, and at least one of said preset potentiometers for said scene whereby the effects of a fault causing abnormal currents to flow which develops after said fault isolating means will not disrupt the operation of channel potentiometers connected to other fault isolating means.

13. In a lighting console providing outputs to dimming means, said console including:

(a) master controls for at least two scenes; and

(b) channel controls for each of a plurality of channels, said channel controls including at least a first and second preset potentiometer, said channel controls and said master controls cooperating to allow presetting; and,

(c) at least one port for communications with an external control means at another location, said port including at least one active electronic component;

(d) at least one positive power supply producing a voltage within the safe operating region of said active electronic component, and means establishing a more negative reference potential within the safe operating region of said active component, the improvement comprising:

(e) means for protecting said active electronic component against damage caused by relative voltage swings greater than said safe operating region comprising:

(f) a first diode coupled between said port and a low impedance path to said positive power supply:

(g) a second diode coupled between said port and a low impedance path to said reference; and

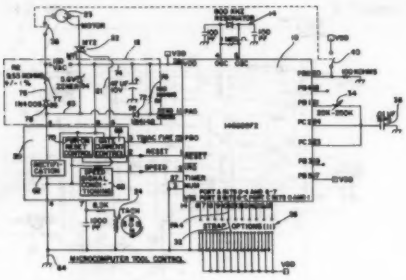
(h) means for current limiting coupled between said diodes and said port, whereby a more positive or more negative voltage imposed on said port will be limited to within the safe operating region of said connected active component.

4,550,277

OVERLOAD DETECTION AND WARNING SYSTEM FOR ELECTRIC MOTORS IN POWER TOOLS AND THE LIKE

Joseph E. Carney, Baltimore, Md., assignor to Black & Decker Inc., Newark, Del.

Filed Sep. 24, 1984, Ser. No. 653,780
Int. Cl.[4] H02P 5/16
U.S. Cl. 318—334 11 Claims



1. A method for providing a warning that a given operating condition in a power tool has been detected, comprising the steps of:

(a) gradually reducing the power delivered to the tool upon detection of said given operating condition until a predetermined non-zero reduced level is reached; and

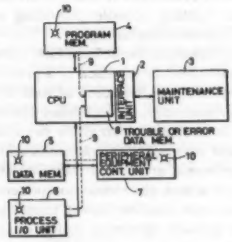
(b) thereafter cyclically increasing and decreasing the power delivered to said tool in predetermined amounts to cause the tool to discernably exhibit a cyclic behavior which constitutes said warning.

4,550,278

CONTROL DEVICE

Kimio Yamanaka, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 14, 1982, Ser. No. 398,136
Int. Cl.[4] G05D 23/275
U.S. Cl. 318—632 4 Claims



1. In a control device having a control memory for temporarily storing data, the operation of which is controlled by a program, and a process I/O unit serving as an interface for external data, the improvement comprising;

memory means for storing trouble data representative of errors and abnormal operations in said memory and process I/O unit, in combination with the sequence of occurrence of said errors and the number of occurrences of said errors; and

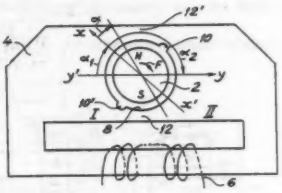
means for editing and displaying said trouble data stored in said memory section, together with an error occurrence history.

4,550,279

STEP-BY-STEP MOTOR UNIT

Eric Klein, Les Hauts-Geneveys, Switzerland, assignor to Fabriques D'horlogerie De Fontainemelon S.A., Fontainemelon, Switzerland

Filed Sep. 7, 1983, Ser. No. 530,116
Claims priority, application Switzerland, Sep. 10, 1982, 5384/82
Int. Cl.[4] H02K 29/04
U.S. Cl. 318—696 5 Claims



1. A motor unit comprising a stepping motor having a rotor and a stator fitted with a coil, and a control pulse generating circuit for applying drive pulses to said coil to cause the rotor to rotate N steps at high speed, said rotor capable of a forward or reverse rotation of said N steps, said circuit comprising means for successively producing and applying to the coil:

a starting drive pulse to initiate rotation of the motor in one of said directions;

N-2 simple maintaining drive pulses of alternating polarity to cause the rotor to rotate N-2 steps in said one direction; and

a simple stopping drive pulse having a polarity opposite to that of the last maintaining pulse,

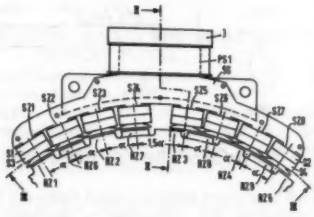
and means for controlling the time of application of said maintaining drive pulses and of said stopping drive pulse dependent on the angular position of the rotor.

4,550,280

MOTOR/GENERATOR OPERATING ON THE RELUCTANCE PRINCIPLE

Werner Freise, Kaiserslautern, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany

Filed Sep. 8, 1983, Ser. No. 530,309
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1982, 3233502
Int. Cl.[4] H02K 7/02; H02P 7/36
U.S. Cl. 318—701 25 Claims



1. A motor/generator with flywheel rotor operating on the reluctance principle, comprising:

(a) a stator having a plurality of independent sector stators distributed over the circumference of the rotor at tangential distance from each other; each sector stator having at least two similarly toothed sector stator elements arranged at an axial spacing and with axially aligned teeth one

behind the other, with common working windings in the grooves between the teeth and commutated via an electronic switching device; each sector stator element terminating in a radially projecting pole shank, and enveloped by a concentrated exciter winding part; the pole shanks of two sector stator elements of a sector stator arranged axially one behind the other are excited in the sense of opposite polarity and are axially connected on the outside by a flux return yoke; and

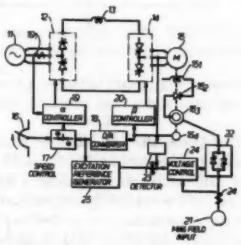
(b) a rotor porvided with tooth rows evenly distributed over its circumference and connected for magnetic conduction, each having a pitch concording with double the pitch of a sector stator element, in such a way that each stator tooth row has a rotor tooth row correlated to it.

4,550,281

SYNCHRONOUS MOTOR CONTROL

Akio Hirata, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 1, 1983, Ser. No. 528,432
Claims priority, application Japan, Sep. 25, 1982, 57-166014
Int. Cl.⁴ H02P *5/40*
U.S. Cl. 318—723 **20 Claims**



1. A method of controlling a synchronous motor driving a square-law torque load by means of a frequency changer which can vary its output voltage and output frequency, said method comprising the steps of:

monitoring the speed N of said synchronous motor;

generating a reference armature voltage Va related to the speed of said motor, a ratio of said reference voltage Va and said speed N being smaller than Va(100)/N(100), where said N(100) is the rated motor speed and said Va(100) is the armature voltage of said motor at a speed of said N(100), for all motor speeds below a predetermined value to reduce the necessary capacity of a field AC power source for said motor and said ratio being larger than Va(100)/N(100) for all motor speeds above said predetermined value to improve the power factor of said motor at speeds above said predetermined value;

controlling the armature voltage of said motor to said reference voltage.

4,550,282

METHOD AND DEVICE FOR CONTROLLING A BRUSHLESS ALTERNATING CURRENT MOTOR

Carl S. M. Hartwig, Täby; Erik A. Ljung, Stockholm, and Erik M. Obel, Danderyd, all of Sweden, assignors to Institut CERAC S.A., Ecublens, Switzerland

Filed Mar. 9, 1983, Ser. No. 473,743
Int. Cl.⁴ H02P *5/40*
U.S. Cl. 318—808 **4 Claims**

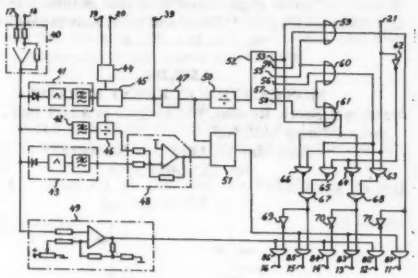
1. A method for controlling a brushless AC motor driven by an inverter having switching means, said inverter being connected to a DC supply whereby alternating current fed to the AC motor terminals is provided by the controlled actuation of said switching means to successively connect the motor terminals to the positive and negative terminals of said direct current supply comprising the steps of:

directly sensing the direct current supplied to said inverter for providing a sensed current signal,

applying said sensed current signal to a first peak detector having a predetermined time constant for obtaining a first peak value signal,

applying said first peak value signal to a first regulator for generating a frequency control signal for controlling the frequency of said alternating current,

decreasing said frequency control signal of said first regulator when said first peak value signal exceeds a predetermined value,



passing said sensed current signal through a low pass filter to obtain a mean value signal,

dividing said mean value signal by said frequency control signal to derive a first voltage control signal,

applying said first voltage control signal to a second regulator for providing an output signal which varies in amplitude in the same direction as said first voltage control signal,

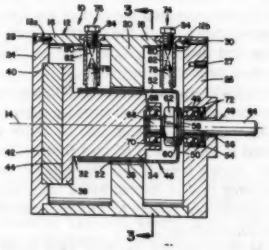
and controlling said alternating current with said output signal.

4,550,283

UNIPOLAR ROTATIONAL SPEED TRANSDUCER

Robert L. Leach, Hawthorne, and Richard L. Wickens, Franklin Lakes, both of N.J., assignors to Servo-Tek Products Company, Hawthorne, N.J.

Filed Aug. 3, 1983, Ser. No. 519,971
Int. Cl.⁴ H02K *17/42, 1/22*
U.S. Cl. 322—48 **29 Claims**



29. A unipolar direct current generator comprising a housing having an axis and axially opposite ends, an end wall closing each of said opposite ends, said housing and one of said end walls being of magnetic material and the other of said end walls being of non-magnetic material, a circular pole member of magnetic material within and coaxial with said housing, said pole member having a first end axially spaced from said one end wall and a second end axially spaced from said other end

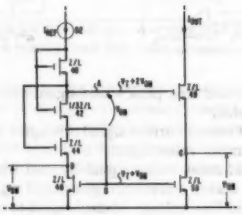
wall, a permanent magnet in the space between said one end wall and said first end of said pole member, said housing including an annular pole portion between said opposite ends thereof surrounding said pole member between said first and second ends thereof and providing an annular air gap therewith, a cup-shaped rotor of conductive material coaxial with said housing and having an annular side wall rotatable in said air gap, said rotor having a closed end adjacent said other end wall and an open end adjacent said first end of said pole member, a rotor drive shaft coaxial with said housing and extending through said other end wall, said shaft being rotatable and fastened to said rotor, first and second brush elements on said housing for radial engagement with said annular side wall of said rotor adjacent said closed and open ends thereof.

4,550,284

MOS CASCODE CURRENT MIRROR

Navdeep S. Sooch, Reading, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 16, 1984, Ser. No. 610,881
Int. Cl.[4] G05F *3/08*
U.S. Cl. 323—315 **5 Claims**



1. An MOS current mirror including an input circuit branch and an output circuit branch, where the input circuit branch is responsive to a reference current and the output circuit branch mirrors the reference current to produce an output current substantially equal to said reference current, the input branch comprising

a series connection of a plurality of four MOS transistors each MOS transistor having a gate, a source, and a drain electrode, where the drain of the first MOS transistor is responsive to said reference current and the gate of said first MOS transistor is connected to both said drain and the gate of the second MOS transistor, the gate of the third MOS transistor is connected to both the source of said first MOS transistor and the drain of said second MOS transistor, and the gate of the fourth MOS transistor is connected to both the source of said second MOS transistor and the drain of the third MOS transistor; and

the output branch comprising

a pair of MOS transistors each MOS transistor having a gate, a source, and a drain electrode, where the gate of a first MOS transistor of said pair of MOS transistors is connected to the source of said first MOS transistor of said input circuit branch and the gate of the remaining MOS transistor of said pair of MOS transistors is connected to the gate of said fourth MOS transistor of said input circuit branch, wherein

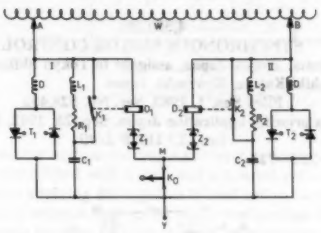
each MOS transistor of both said input and said output circuit branches comprises a channel constant defined by its associated channel width divided by its associated channel length, wherein the channel constant of said second MOS transistor of said input circuit branch is at most one-third the value of the channel constant associated with the remaining MOS transistors, where each of the remaining MOS transistors comprises substantially identical channel constant.

4,550,285

LOAD-SWITCHING CIRCUIT FOR ANTIPARALLEL THYRISTOR NETWORKS AND A TAPPED TRANSFORMER

Kurt Kugler, Hainsacker; Hans-Henning Lessmann-Mieske, Tegernheim, and Franz Wein, Beratzhausen, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Reinhausen Gebruder Scheubeck GmbH & Co. KG, Regensburg, Fed. Rep. of Germany

Filed Jun. 27, 1983, Ser. No. 508,439
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1982, 3223892
Int. Cl.[4] H01F *29/04*
U.S. Cl. 323—343 **4 Claims**



1. A load-switching circuit between a transformer having a pair of voltage taps and a load terminal, said circuit comprising:

respective substantially identical networks connected between said load terminal and a respective one of said taps, each of said networks including a pair of antiparallel thyristors, and a damping impedance in series with a commutating condenser connected in parallel to said pair of antiparallel thyristors, said condenser being dimensioned to suppress voltage surges applicable to said thyristors in a blocking state thereof; and

respective contacts connected in shunt across said damping impedances and selectively operable to short circuit the respective damping impedance of a network whose thyristors are in a blocking state, thereby enabling the respective condenser to function as a surge suppressor.

4,550,286

ONBOARD METHOD OF DETECTING ELECTRICAL FAULTS IN A VEHICULAR AIR SUSPENSION SYSTEM

Scott B. Holland, Sterling Heights, and Bruce D. Strachan, Canton, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 12, 1984, Ser. No. 570,102
Int. Cl.[4] G01R *31/02*
U.S. Cl. 324—51 **4 Claims**

1. A method for detecting electrical faults in a vehicular air suspension system incorporating at least one height sensor mounted between sprung and unsprung components of the vehicle, containing electrical circuitry for indicating, with two bits of output information, one range of three defined ranges of separation between said sprung and unsprung components, comprising the steps of:

defining an invalid indication by said two bits of information from said height sensor;

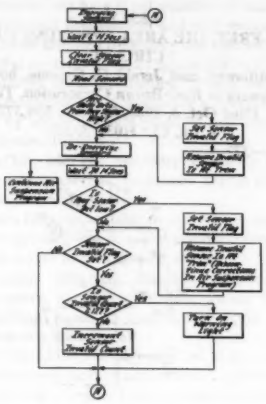
electrically energizing said electrical circuit of said at least one height sensor;

reading the range of separation indicated by said two bits of output information;

comparing said two bits of output information with said defined invalid indication and outputting a fault signal whenever said comparison indicates equality; and

recording each occurrence of said fault signal;

repeating the above steps until the number of occurrences of fault signals exceeds a predetermined number; and



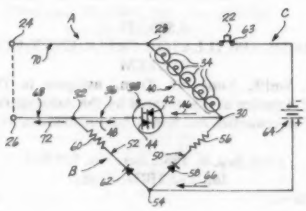
providing a human detectable fault indication when the number of fault signal occurrences exceed said predetermined number.

4,550,287

DATA BUS TEST INSTRUMENT HAVING A TRI-COLORED LED AND INDICATING CONTINUITY, VOLTAGE AND POLARITY

Daniel L. Babcock, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Aug. 11, 1983, Ser. No. 522,856
Int. Cl.⁴ G01R *19/14, 19/145, 31/02, 15/12*
U.S. Cl. 324—73 R **5 Claims**



1. An instrument for testing an electrical circuit, said instrument indicating (1) the presence of data bus signals in a circuit, (2) whether such data bus signals are of a low speed or a high speed nature, (3) continuity of a circuit, (4) voltage in a circuit, and (5) the polarity of a DC voltage in a circuit, said instrument comprising:

first (**24**) and second (**26**) terminals connectable to the electrical circuit to be tested;

a first circuit leg (**A**) comprising a first junction (**28**), a second junction (**30**), and a third junction (**32**), wherein said first junction (**28**) is connected to one of said terminals, and wherein said third junction (**32**) is connected to the other of said terminals;

ballast means (**40**) connecting said first (**28**) and second (**30**) junctions, said ballast means (**40**) including voltage indicator means for indicating the voltage of said circuit being tested;

a tri-color LED (**38**) connected between said second (**30**) and third (**32**) junctions;

a second circuit leg (**B**) connecting a fourth junction (**54**) to said first circuit leg (**A**), said second circuit leg (**B**) including a first unidirectional conductor (**50**) having a certain resistance and being connected between said fourth (**54**) and said second (**30**) junctions, said first conductor (**50**) permitting electrical current to flow only in a direction from said fourth junction (**54**) to said second junction (**30**), and a second unidirectional conductor (**52**) having a certain resistance and being connected between said fourth junction (**54**) and said third junction (**32**), said second conductor (**52**) being operable to permit electrical current to flow only in a direction from said fourth junction (**54**) to said third junction (**32**); and

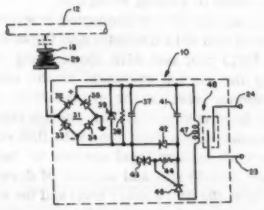
a third circuit leg (**C**) including a switch (**22**) and a battery (**64**), said switch (**22**) serially connecting said battery (**64**) to said first junction (**28**), and with said battery (**64**) also being connected to said fourth junction (**54**).

4,550,288

VOLTAGE LOSS SENSOR AND ALARM

Edmund O. Schweitzer, Jr., 2433 Center St., Northbrook, Ill. 60062

Filed Jul. 29, 1983, Ser. No. 518,536
Int. Cl.⁴ G01R *19/14*
U.S. Cl. 324—133 **9 Claims**



1. A loss of voltage sensor for producing an output signal in response to the loss of voltage in a conductor of an electrical system, comprising:

a first capacitor;

a second capacitor;

charge current producing means powered from the conductor for charging said first and second capacitors;

first discharge means in circuit relationship with said first capacitor for discharging only said first capacitor upon removal of charge current from said first capacitor;

voltage threshold means in circuit relationship with said first and second capacitors for producing a trigger signal when the difference between the voltages of said first and said second capacitors exceeds a predetermined value; and

second discharge means in circuit relationship with said second capacitor and said voltage threshold means for discharging said second capacitor in response to said trigger signal produced by said voltage threshold means to produce said output signal.

4,550,289

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Katsuhiko Kabashima, Kawasaki; Yoshihiro Takemae, Yokohama; Shigeki Nozaki; Tsuyoshi Ohira, both of Kawasaki; Hatsuo Miyahara, Yokohama; Masakazu Kanai, Yokohama, and Seiji Enomoto, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 27, 1982, Ser. No. 453,115
Claims priority, application Japan, Dec. 29, 1981, 56-214815
Int. Cl.⁴ G01R *31/22*
U.S. Cl. 324—158 R **4 Claims**

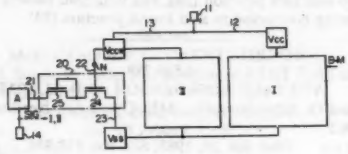
1. A semiconductor integrated circuit device fabricated in and on a single chip having a normal operation mode and a test mode, and having at least one external input/ouput/detection

(I/O/D) pin operatively connected to receive a first or second voltage level, comprising:

at least one internal test node selectively having one of a ground level and a power source level in accordance with the mode of the device; and

a test circuit formed in the single chip, comprising:

a MIS transistor having a gate operatively connected to said at least one internal test node, having a drain operatively connected to ground level and having a source, said MIS transistor selectively having one of a first threshold voltage and a second threshold voltage, the second threshold voltage being higher than said first threshold voltage in accordance with said at least one



internal test node, respectively being at the power source level or ground level; and

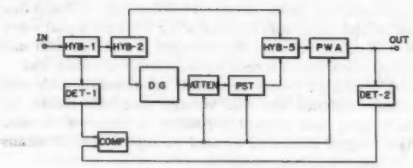
a MIS diode, operatively connected in series between said source of said MIS transistor and the at least one external I/O/D pin, said MIS diode being reverse biased during the normal operation mode, said test circuit determining whether the ground level or the power source level is at said at least one internal test node, in accordance with a detection of the first voltage level or the second voltage level applied to the at least one external I/O/D pin, and capable of drawing a current therefrom, the first voltage level and the second voltage level being outside the range between the power source level and ground level.

4,550,290

FET POWER AMPLIFYING APPARATUS

Hiroshi Igarashi, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 18, 1984, Ser. No. 632,052
Claims priority, application Japan, Jul. 22, 1983, 58-133721
Int. Cl.⁴ H03F *1/26, 3/10*
U.S. Cl. 330—149 **17 Claims**



1. An FET power amplifying apparatus, comprising:

an FET power amplifier for amplifying an input signal to produce an output signal;

means for producing a control signal which corresponds to a magnitude ratio of the input signal and the output signal;

means for receiving the input signal and for producing a distortion signal having a distortion component with the same amplitude and an inverted phase as a distortion component produced by said FET power amplifier when the input signal is applied thereto;

means for controlling the amplitude and phase of said produced distortion signal in accordance with said produced control signal; and

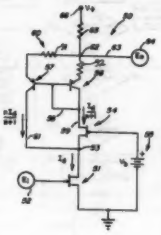
means for compensating the distortion component being produced by said FET power amplifier, in accordance with said controlled distortion signal.

4,550,291

NOISE-FREE, DIE AREA EFFICIENT CASCODE CIRCUIT

Steven D. Millaway, and Jerald G. Graeme, both of Tucson, Ariz., assignors to Burr-Brown Corporation, Tucson, Ariz.

Filed Oct. 3, 1983, Ser. No. 538,377
Int. Cl.⁴ H03F *3/16*
U.S. Cl. 330—277 **33 Claims**



14. A cascode circuit comprising:

an amplifier input stage for controlling current therethrough;

a load impedance for receiving current from said amplifier input stage;

a JFET cascode means for substantially eliminating all circuit noise; and

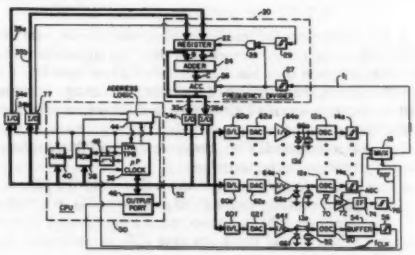
a current divider means for diverting a majority of the current passing through said amplifier input stage and said load impedance around said JFET cascode means for reducing the die area required for implementing the JFET cascode means to a realistic size for monolithic integration circuit implementation.

4,550,292

AUTOMATIC OSCILLATOR FREQUENCY CONTROL SYSTEM

Stephen F. Smith, Knoxville, Tenn., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 6, 1983, Ser. No. 529,803
Int. Cl.⁴ H03L *7/08*
U.S. Cl. 331—2 **16 Claims**



1. A frequency control system, comprising:

divider means (20) including a register (26) having n-bits of binary capacity and means (24) for incrementing the contents of said register with a first number in response to reception of each pulse of a cyclical signal;

programmable processing means (**30**) interconnected with said divider means and operable in sequential machine cycles for generating said first number and second number during an interval set by a fixed number of said machine cycles wherein said first number and said second number correspond to an assigned frequency and are employed for comparing the contents of said register (**26**) with a predetermined number upon termination of said interval, and further, are employed for propagating a correction signal determined by any difference between said contents and said predetermined number;

a source (**12***a*/**12***e*, **14***a*/**14***e*, **66***a*/**66***e*) providing a cyclical signal with a characteristic frequency that is correctable by reception of a shifting signal;

switching means (**16**) connectable to said source, operatively enabled during reception of said second number to apply said cyclical signal to said divider means;

converting means (**60***a*/**60***e*, **62***a*/**62***e*, **64***a*/**64***e*) operatively responsive to said processing means for applying said shifting signal to said source upon reception of said correction signal; and

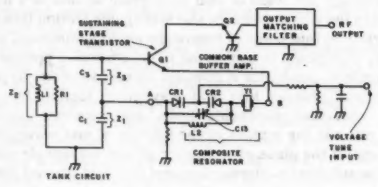
timing means (**50**, **52**, **54**, **56**, **66***f*) coupled to said processing means for initiating each of said machine cycles, whereby after said termination of said interval, said contents of said register (**26**) contain a modulo-(2^n-Q) sum representing the product of said first number, said characteristic frequency, the duration of said interval, and 2^{-n}, thereby enabling said programmable processing means to gauge any variation in the product of the period of said machine cycles and said characteristic frequency by comparing said sum to said predetermined number, to use said variation to determine the value of said correction signal, and to apply said correction signal to said converting means.

4,550,293

NARROW DEVIATION VOLTAGE CONTROLLED CRYSTAL OSCILLATOR

Michael M. Driscoll, Catonsville, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 27, 1984, Ser. No. 574,434
Int. Cl.[4] **H03B** *5/36*
U.S. Cl. 331—116 R **8 Claims**



1. A voltage controlled crystal oscillator comprising:

a sustaining stage transistor having a base, an emitter and a collector;

a parallel resonant tank circuit including a first inductor and a pair of serially-connected capacitors coupled between the base of said sustaining stage transistor and a reference terminal;

a composite resonator having a first terminal coupled to the junction of said first and second capacitors and a second terminal coupled to the emitter of said sustaining stage transistor;

said composite resonator including a crystal in series connection with the parallel combination of a second inductor and capacitance means,

said capacitance means including a pair of serially-connected voltage variable capacitance devices;

means for applying a varactor bias voltage to the junction of said pair of serially-connected voltage variable capacitance devices;

means coupled between said first terminal of said composite resonator and said reference terminal for providing a direct current path for said varactor bias voltage; and

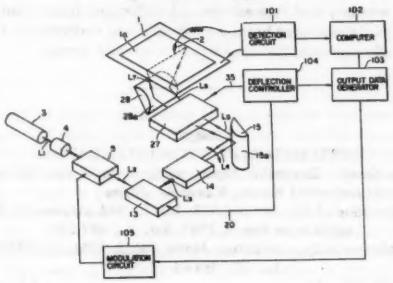
means coupled to the collector of said sustaining stage transistor for deriving an output signal from said oscillator.

4,550,294

PATTERN INDICATION USING LASER BEAM

Yoshiki Kishi; Toyotoshi Hirotani; Tomohiro Ohira, all of Yatabe, and Yukio Fukui, Ibaraki, all of Japan, assignors to Director-General of Agency of Industrial Science and Technology, Tokyo, Japan

Filed Oct. 31, 1983, Ser. No. 547,233
Int. Cl.[4] **H01S** *3/10*; **G08C** *9/00*
U.S. Cl. 332—7.51 **4 Claims**



1. A device for visually representing on a screen output data generated from an output data generator, comprising:

(a) a laser beam modulation circuit supplied with the output data and generating modulation signals in accordance with the output data;

(b) a first beam splitter for separating by polarization a laser beam from a laser source into a first polarized wave and a second polarized wave;

(c) a first modulator connected to the laser beam modulation circuit for modulating said first polarized wave according to said modulation signals so that the intensity of said first polarized wave is varied in accordance with said modulation signals and said first polarized wave is periodically extinguished in synchronism with a predetermined simple harmonic oscillation for a period in the range of between $(2n+3/2)\pi$ and $(2n+5/2)\pi$ of the phase of said predetermined simple harmonic oscillation;

(d) a second modulator connected to said laser beam modulation circuit for modulating said second polarized wave according to said modulation signals so that the intensity of said second polarized wave is varied in accordance with said modulation signals and said second polarized wave is periodically extinguished in synchronism with said predetermined simple harmonic oscillation for a period in the range of between $(2n+\frac{1}{2})\pi$ and $(2n+3/2)\pi$ of the phase of said predetermined simple harmonic oscillation;

(e) a second beam splitter arranged for receiving the polarized waves from said first and second modulators and for forming a synthesized laser beam;

(f) a first deflection means having a flat mirror located for receiving said synthesized laser beam and arranged to perform said predetermined simple harmonic oscillation so that the incident synthesized laser beam is deflected with its deflectional angular displacement oscillating in synchronism with said predetermined simple harmonic oscillation;

(g) a third beam splitter receiving the deflected laser beam

from said first deflection means for separating same into third and fourth polarized waves corresponding to said first and second polarized waves, respectively, and a fourth beam splitter for synthesizing said third and fourth polarized waves;

(h) an inversion prism located in a light path between said third and fourth beam splitters for inverting either one of said third and fourth polarized waves;

(i) light path length adjusting means located in a light path between said third and fourth beam splitters for adjusting the length of light path of said third and/or fourth polarized waves such that the deflection angle of the deflected synthetic laser beam from said fourth beam splitter is displaced at a cycle of π based on said predetermined simple harmonic oscillation; and

(j) a second deflection means receiving the deflected synthetic laser beam from said light path length adjusting means for deflecting and projecting same on said screen; whereby said first and second deflection means scan the modulated laser beam horizontally and vertically to visually represent the output pattern on said screen.

4,550,295

SWITCHED CAPACITOR INTEGRATOR

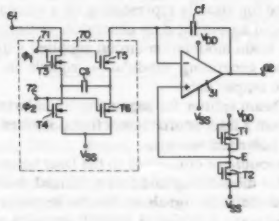
Itsuo Sasaki, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 394,612, Jul. 2, 1982, abandoned. This application Sep. 5, 1984, Ser. No. 647,280

Claims priority, application Japan, Jul. 3, 1981, 56-104119

Int. Cl.⁴ H03H *11/00*

U.S. Cl. 333—19 **3 Claims**



1. A switched capacitor integrator comprising:

only first and second power sources;

only first and second power source terminals connected to said first and second power sources, respectively;

operational amplifier means driven by said first and second power sources and having an inverting input terminal, a non-inverting input terminal, and an output terminal;

feedback capacitor means connected between said inverting input terminal and said output terminal of said operational amplifier means;

bias circuit means connected between said first and second power source terminals and driven by said first and second power sources for providing a given bias voltage to said non-inverting input terminal of said operational amplifier means;

switched capacitor means separated from the non-inverting input terminal of said operational amplifier means; and

switching means for connecting said switched capacitor means between a signal input terminal applied with an input voltage signal and said inverting input terminal of said operational amplifier means in a first operation mode and connecting both ends of said switched capacitor means to one of said first and second power source terminals in a second operation mode.

4,550,296

WAVEGUIDE-MICROSTRIP TRANSITION ARRANGEMENT

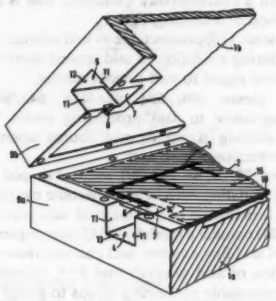
Wolfgang Ehrlinger, Grossbottwar; Gerhard Hirsch, and Michael Alberty, both of Backnang, all of Fed. Rep. of Germany, assignors to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed May 12, 1983, Ser. No. 493,824

Claims priority, application Fed. Rep. of Germany, May 13, 1982, 3217945

Int. Cl.⁴ H01P *5/107*

U.S. Cl. 333—26 **3 Claims**



1. In a waveguide-microstrip transition arrangement, including a waveguide section and a microstrip portion for coupling waveguide modes between the waveguide section and the microstrip portion, the waveguide section having waveguide walls defining waveguide wall surfaces including a short-circuited end wall surface and side wall surfaces with a channel passing through one of the side walls and presenting an opening at the associated wall surface and the microstrip portion including a substrate having opposite sides with a ground plane disposed on one side of the substrate and a microstrip conductor disposed on the other side of the substrate, the waveguide wall surfaces defining the interior of the waveguide section, the improvement wherein said waveguide section comprises two parts which join together at a plane of separation which passes through the walls of said waveguide section at a location where the wall currents of said waveguide section flowing transversely to said plane of separation are at a minimum, said substrate is disposed in said plane of separation, a portion of said microstrip conductor is disposed on said substrate to pass through said channel into said waveguide section free of contact with said waveguide walls, said substrate has no ground plane in the regions of the interior of said waveguide section and of the plane of separation of said waveguide walls where the substrate is disposed, except that said ground plane extends into and terminates within said channel so as to make contact with said one waveguide side wall only within the region of said channel.

4,550,297

RF COMPONENT HAVING SELF-BIASING TO ELIMINATE MULTIPACTING

William H. Harrison, Los Angeles, Calif., assignor to Frequency West Inc., Santa Clara, Calif.

Filed Mar. 28, 1983, Ser. No. 479,717

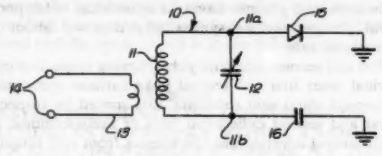
Int. Cl.⁴ H01P *1/00*

U.S. Cl. 333—99 MP **6 Claims**

1. Apparatus for eliminating multipacting in an RF component having at least two electrodes, comprising:

rectifier means, coupled to said RF component, for rectifying the RF potential developed across the electrodes of said component in the absence of multipacting to derive a dc potential therefrom, and

means, coupled to said rectifier means, for applying said derived dc potential to said RF component so as to pre-



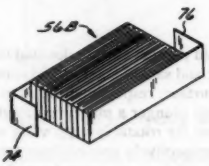
vent polarity reversal of the electric field between said electrodes.

4,550,298

TRIP ASSEMBLY FOR A CIRCUIT BREAKER

Harvey W. Mikulecky, Oconomowoc, Wis., assignor to RTE Corporation, Waukesha, Wis.

Filed Jan. 23, 1984, Ser. No. 572,913
Int. Cl.⁴ H01H *75/12*
U.S. Cl. 335—35 **13 Claims**



1. In a fluid immersible primary circuit breaker which is responsive to fault and overload conditions in a fluid filled electrical apparatus, said breaker including

a frame adapted to be mounted in the fluid in the apparatus,

a first contact mounted on said frame,

a second contact mounted for movement into and out of engagement with said first contact,

a first spring assembly connected to bias said second contact away from said first contact, a second spring assembly movable between a first position biasing said second contact into engagement with said first contact and a second position biasing said second contact away from said first contact,

a latch operably connecting said second spring assembly to said first spring assembly whereby said second contact responds to the position of said second spring assembly,

the improvement comprising a temperature responsive trip assembly for releasing said latch from said first spring assembly, said trip assembly includes a magnet member and a nickel-iron alloy element having a predetermined Curie temperature whereby said first spring assembly will move said second contact away from said first contact in response to a fault or overload condition.

4,550,299

ELECTRIC SWITCH WITH PROTECTIVE FUNCTION

Sven Bachler, Västerås, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed Jul. 3, 1984, Ser. No. 627,668
Claims priority, application Sweden, Jul. 4, 1983, 8303808
Int. Cl.⁴ H01H *77/10*
U.S. Cl. 335—195 **11 Claims**

1. A current-limiting electric switch which comprises

an elongated, fixed counter contact having a first contact plate,

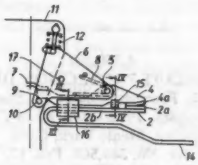
a movable arm,

an elongated movable contact having a first end mounting a second contact plate and a second end, said elongated movable contact being rotatably journalled at a bearing point along its length on said movable arm so as to be movable toward and away from said elongated, fixed counter contact, said second contact plate being abuttable against said first contact plate and forming a breaking unit therewith,

a flexible current connection conductor attached to the second end of said elongated movable contact, and

a first stop means for limiting the rotational movement of said elongated movable contact,

the electric switch operating such that, under the influence of electrodynamic forces during a short-circuit interruption, said elongated movable contact, whose second



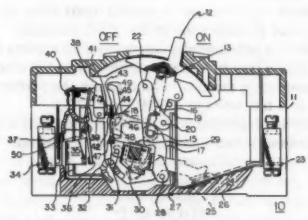
contact plate is in abutting contact with the first contact plate of said elongated counter contact, will first rotate in one direction, its second contact plate remaining in abutting contact with said first contact plate, thereby causing a change in position of said movable arm, the distance between its bearing point and the counter contact increasing, until said elongated movable contact hits said first stop means which stops its rotation in said one direction and causes said elongated movable contact to rotate in a second, opposite direction, resulting in its second contact plate being instantaneously separated from the first contact plate of said elongated counter contact.

4,550,300

LATCH RELEASE MECHANISM FOR MOLDED CASE ELECTRIC CIRCUIT BREAKERS

Charles L. Jencks, Avon, and Roger N. Castonguay, Terryville, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed May 10, 1984, Ser. No. 609,042
Int. Cl.⁴ H01H *75/00, 73/48*
U.S. Cl. 335—16 **4 Claims**



1. A molded case electric circuit breaker comprising:

an operating mechanism for separating a pair of fixed and movable contacts;

a movable contact arm supporting said movable contact at one end and pivotally arranged for operation independent of said operating mechanism;

a cradle operatively connecting between said operating mechanism and an intermediate latch for preventing said operating mechanism from separating said pair of fixed and movable contacts;

a trip unit for sensing current flow through said pair of fixed and movable contacts and moving said intermediate latch

out of contact with said cradle to allow said operating mechanism to separate said fixed and movable contacts when said current exceeds a predetermined value;

a trip bar latch contacting said intermediate latch for preventing said intermediate latch from disengaging said cradle until said current exceeds said predetermined value; and

a latch releasing mechanism proximate said trip bar and said intermediate latch for contact with said trip bar at one end and with said intermediate latch at an opposite end to move said intermediate latch out of contact with said cradle for increasing the rate at which said operating mechanism separates said pair of fixed and movable contacts when said predetermined current value is exceeded.

4,550,301

PTC CIRCUIT PROTECTION DEVICE

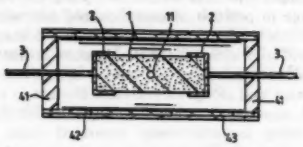
Mary S. McTavish, Fremont; Robert W. Stodieck, Palo Alto, and Frank A. Doljack, Pleasanton, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 349,505, Feb. 17, 1982, Pat. No. 4,481,498. This application Jul. 23, 1984, Ser. No. 633,176

The portion of the term of this patent subsequent to Nov. 6, 2001, has been disclaimed.

Int. Cl.[4] H01C *1/00, 7/02*

U.S. Cl. 338—20 **15 Claims**



1. A circuit protection device which comprises

(1) a PTC element composed of a conductive polymer composition which exhibits PTC behavior and which comprises a polymeric component and, dispersed in the polymeric component, a particulate conductive filler comprising carbon black;

(2) two electrodes which are electrically connected to the PTC element and which are connectable to a source of electrical power to cause current to pass through the PTC element; and

(3) an enclosure

(a) which encloses and is spaced apart from at least the potential erosion zone of the PTC element;

(b) which is substantially impervious to carbon dust; and

(c) at least a part of whose interior surface is composed of an unsulating material which passes the carbon burn-off test at a test voltage of 440 volts DC,

whereby the adverse effects of carbonaceous dust evolved by the PTC element when it is tripped are minimized.

4,550,302

SOLENOID

Shuichi Watanabe, Neyagawa, and Noboru Katakabe, Uji, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Nov. 2, 1983, Ser. No. 548,135

Claims priority, application Japan, Nov. 9, 1982, 57-196432; Jan. 20, 1983, 58-8417

Int. Cl.[4] H01F *7/08*

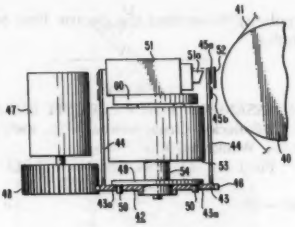
U.S. Cl. 335—228 **10 Claims**

1. A solenoid device, comprising:

(a) a magnetic rotator having a rotational axis and a cylindrical outer peripheral rotator surface symetrically disposed about said rotational axis;

(b) a plunger, movable along said axis between a first position in which said plunger is spaced from said rotator by a first predetermined distance and a second position in which said plunger is spaced from said rotator by a second predetermined distance less than said first predetermined distance, said plunger having a cylindrical outer peripheral plunger surface symetrically disposed about said rotational axis;

(c) first and second magnetic yokes, having respective cylindrical inner first and second yoke surfaces symetrically disposed about said rotational axis spaced by respective first and second cylindrical gaps of predetermined first and second constant gap thicknesses from said rotational



surface and said plunger surface, located sufficiently close to said rotator and said plunger at said rotator surface and said plunger surface, respectively, so as to form with said rotator and said plunger a magnetic circuit;

(d) support means for rotatably supporting said rotator and said plunger respectively spaced from said first and second yokes by said first and second gap thicknesses; and

(e) magnetic flux generating means for generating magnetic flux in said magnetic circuit such that said plunger is moved by magnetic attraction from said first position to said second position.

4,550,303

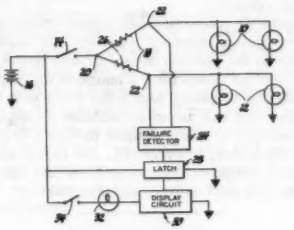
LAMP MONITOR WITH LATCH CIRCUIT

Robert E. Steele, Cortland, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 5, 1984, Ser. No. 597,112

Int. Cl.[4] B60Q *1/26*

U.S. Cl. 340—80 **2 Claims**



1. A vehicle lamp monitor for providing a warning signal when lamp failure occurs and for continuing the warning signal whenever the vehicle is operated until a correction is made, wherein the vehicle has a vehicle power supply, an ignition switch means, and a lamp circuit including lamp switch means for operatively connecting the lamp to the power supply, the monitor comprising

a lamp failure detector coupled to the lamp circuit for detecting a lamp failure during operation of the lamp circuit,

a latch circuit connected to the power supply independently of said switch means and coupled to the lamp failure detector for assuming a failure state when a lamp failure is detected and thereafter maintaining such failure state

while the failure condition persists independently of the state of the switch means,

a warning circuit coupled to the latch circuit and connected through the ignition switch means to the power supply for providing a warning signal when the ignition switch is closed and the latch circuit is in the failure state.

4,550,304

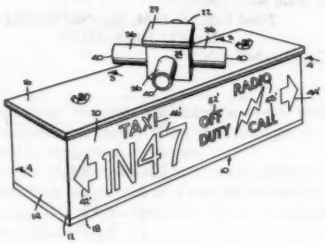
SYSTEM FOR SIGNALLING CONDITIONS OF, INCLUDING AN EMERGENCY WITHIN, A VEHICLE

Joseph P. Saitta, 2160 Washington St., Merrick, N.Y. 11566

Filed Mar. 10, 1983, Ser. No. 474,177

Int. Cl.⁴ B60Q *1/00*

U.S. Cl. 340—84 **27 Claims**



1. A system for signalling an emergency within a vehicle, comprising:

a main housing mountable on the vehicle at a location visible laterally from all points about the vehicle;

warning light producing means mounted within said main housing for producing warning light;

optical means for causing the warning light produced by said warning light producing means to be projected from said housing as a plurality of beams each of which is oblique with respect to the major axis of the vehicle, said optical means comprising a plurality of elongate tubular members mounted on said main housing each having an axis extending obliquely with respect to the major axis of the vehicle when said main housing is mounted thereon and through each of which the warning light produced by said warning light producing means is projected as one of the beams; and

means for actuating said warning light producing means unobtrusively from within the vehicle.

4,550,305

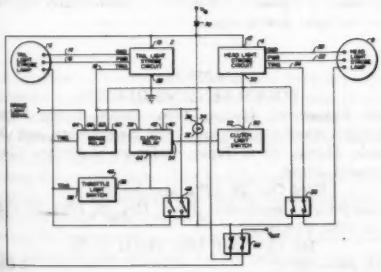
PULSATING LAMP SYSTEM FOR VEHICLES

David Bookbinder, 448 E. Annette Dr., Phoenix, Ariz. 85022

Filed Jan. 4, 1984, Ser. No. 568,049

Int. Cl.⁴ B62J *5/00*

U.S. Cl. 340—134 **12 Claims**



1. A lighting system for use on a motorcycle of the type which includes a throttle which when closed reduces the amount of fuel being consumed, a clutch which when disengaged disconnects the motorcycle's engine from its transmission, a breaking system for stopping said motorcycle, and a first source of electrical energy activated by the motorcycle's ignition, said lighting system comprising:

a first strobe lamp visible from the front of said motorcycle;

a second strobe lamp visible from the rear of said motorcycle;

first means coupled to said first strobe lamp and to said first source for supplying a first electrical pulsating trigger signal to said first strobe lamp, said first means including a first source of said first trigger signal, and first switch means coupled between said first source of said first trigger signal and said first strobe lamp for conducting said first trigger signal to said first strobe lamp when said first switch means is in a first state; and second means coupled to said second strobe lamp and to said first source for supplying a second electrical pulsating trigger signal to said second strobe lamp, said second means including a second source of said second trigger signal, and second switch means coupled between said second source and said second strobe lamp for conducting said second trigger signal when said second switch means is in a first state.

4,550,306

SIGNAL TRANSMISSION SYSTEM FOR FIRE ALARM JUNCTION LINE

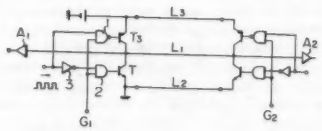
Tetsuo Kimura, Tokyo, Japan, assignor to Nittan Company, Limited, Tokyo, Japan

Filed Nov. 15, 1982, Ser. No. 441,752

Claims priority, application Japan, Nov. 16, 1981, 56-182238

Int. Cl.⁴ H04B *3/54, 3/38;* G08B *29/00*

U.S. Cl. 340—310 R **7 Claims**



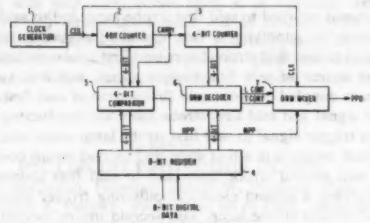
1. A signal transmission system for a fire alarm junction line whereby information on the conditions of operation of a plurality of fire detectors, signals for controlling equipment for prevention of spread of fire and exhaust of smoke, etc. are transmitted between repeaters to which fire detectors are connected and a receiving unit of a fire alarm system, wherein the junction line comprises three wires, one wire of said junction line being a power source line connected to a power source on the receiving unit side, another wire of said junction line being a grounding line connected to the ground, and the third wire of said junction line being a signal line which is connected to the junction point of a serial connection of a first switching element and a second switching element, said serially connected switching elements being connected between the power source line and the grounding line and operating complementarily with each other, and a binary signal of a zero potential and a power source potential being applied to the control terminals of the two switching elements to send out a signal to the junction line.

4,550,307

PULSE GENERATOR

Mineo Akashi, and Yoshitaka Kitada, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 14, 1983, Ser. No. 458,079
Claims priority, application Japan, Jan. 14, 1982, 57-4556
Int. Cl.[4] H03K *13/02*
U.S. Cl. 340—347 DA **10 Claims**



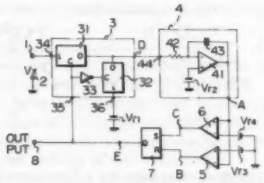
1. A pulse generator comprising means for providing a clock signal having a clock period, means for generating a pulse train containing a plurality of signal pulses with pulse widths modulated in accordance with upper bits of an input digital signal, means for shifting the leading-edge of an arbitrary signal pulse in said pulse train by a duration of one half of the period of said clock signal in accordance with the value of lower bits of said input digital signal thereby to enlarge the pulse width of said arbitrary signal pulse, and means for shifting the trailing-edge of another signal pulse in said pulse train by a duration of one half of the period of said clock signal thereby to enlarge the pulse width of said another signal pulse.

4,550,308

SIGNAL CONVERTING APPARATUS

Norihito Tokura, Aichi; Hisasi Kawai, Toyohashi; Tokio Kohama, Nishio, and Kenji Kanehara, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Apr. 20, 1983, Ser. No. 486,840
Claims priority, application Japan, Apr. 21, 1982, 57-65408
Int. Cl.[4] H03K *13/20*
U.S. Cl. 340—347 NT **14 Claims**



1. An apparatus for converting a voltage signal into a pulse signal having a pulse-width corresponding to the voltage level of said voltage signal, comprising:

input means for generating an input voltage to be pulse-width converted; and

conversion means for converting said input voltage generated by said input means into an output pulse signal having a pulse-width corresponding to the voltage level of said input voltage signal; said conversion means comprising:

(a) first voltage supply means for producing a voltage signal having a constant voltage level;

(b) means for selecting either said input voltage signal or said constant voltage signal, in response to said output pulse signal of said conversion means;

(c) integrating means for integrating the selected signal selected by said selecting means with respect to time, to produce an integrated signal; and

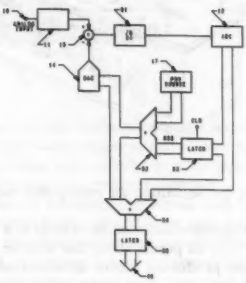
(d) means for comparing the voltage level of said integrated signal from said integrating means with a lower limit voltage level and with an upper limit voltage level, and for inverting the level of said output pulse signal of said conversion means when the voltage level of said integrated signal from said integrating means is less than or equal to said lower limit voltage level and when the voltage level of said integrated signal from said integrating means is greater than or equal to the upper limit voltage level.

4,550,309

ANALOG TO DIGITAL CONVERTER

Donald R. Hiller, Lake Stevens, and Charles Kingsford-Smith, Mukilteo, both of Wash., assignors to Hewlett Packard Company, Palo Alto, Calif.

Filed Feb. 16, 1984, Ser. No. 580,584
Int. Cl.[4] H03K *13/17*
U.S. Cl. 340—347 AD **2 Claims**



1. Apparatus for converting an input analog signal into a substantially equivalent digital signal, said apparatus comprising:

a source of pseudo-random noise;

an analog-to-digital converter including a digital-to-analog converter for producing a plurality of digital approximations of the input analog signal;

a first adder for coupling signals from the source of pseudo-random noise to the digital-to-analog converter for producing an analog noise signal, in opposite phase to the input analog signals for combining said analog noise signal with the first digital approximation of the input analog signal, and for coupling said combined noise and first digital approximation signal to said analog-to-digital converter to produce a second digital approximation signal; and

a second adder coupled to the analog-to-digital converter and to the first adder for combining the first digital approximation with the second digital approximation to produce a digital signal which is substantially equivalent to the input analog signal.

4,550,310

TOUCH SENSING DEVICE

Hisashi Yamaguchi, Hyogo; Toru Asano, Kobe; Kazuhiro Takahara, Akashi; Keizo Kurahashi, Sagamihara, and Shizuo Andoh, Akashi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 28, 1982, Ser. No. 437,220
Claims priority, application Japan, Oct. 29, 1981, 56-174029; Feb. 25, 1982, 57-030235
Int. Cl.[4] G06F *3/02;* **H01H** *35/00*
U.S. Cl. 340—365 C **2 Claims**

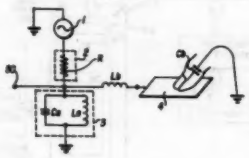
1. A touch sensing device for detecting a touched condition of a touch electrode wherein the capacitance of said touch

electrode changes when said touch electrode is touched and not touched, said device comprising:

(a) an oscillator means for generating a constant frequency AC signal;

(b) parallel resonant circuit means, said resonant circuit means being tuned to the frequency of said oscillator means;

(c) impedance circuit means coupling said oscillator means to said resonant circuit means;



(d) an impedance element connected in series with said resonant circuit means, said impedance element also being connected to said touch electrode;

(e) wherein the touched and not touched conditions of said touch electrode is detected as a change in voltage at the connecting point of said impedance circuit means and said resonant circuit means.

4,550,311

REMOTE SENSING SYSTEMS

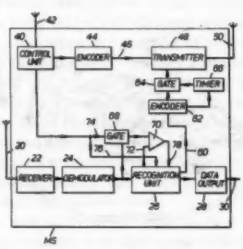
John L. Galloway, Edinburgh; Timothy R. F. Hankins, Balerno, and Ian A. Owers, Kirkliston, all of Scotland, assignors to Racal Security Limited, Newbridge, Scotland

Filed Dec. 1, 1983, Ser. No. 556,915

Claims priority, application United Kingdom, Dec. 2, 1982, 8234443

Int. Cl.⁴ G08B *1/00*

U.S. Cl. 340—531 **17 Claims**



8. A method of preventing interference between adjacent installations each comprising a respective group of remote stations which transmit information to a respective master station by means of signals which are identified by an access code, comprising the steps of

causing the access codes of all installations within reception range of the location of a proposed new installation to be automatically monitored, and

sensing the monitored access codes and responding thereto by automatically selecting for the proposed new installation a value of access code which is different from the monitored access codes.

4,550,312

REMOTE SENSING SYSTEMS

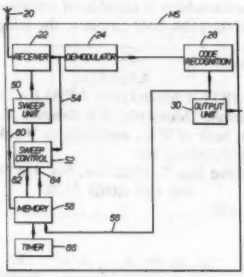
John L. Galloway, Edinburgh, and Timothy R. F. Hankins, Balerno, both of Scotland, assignors to Racal Security Limited, Newbridge, Scotland

Filed Dec. 1, 1983, Ser. No. 557,104

Claims priority, application United Kingdom, Dec. 2, 1982, 8234442

Int. Cl.⁴ G08B *1/08*

U.S. Cl. 340—539 **3 Claims**



1. An alarm-condition monitoring system, comprising

a master station,

a group of alarm-condition-sensing remote units for respectively sensing the existence of alarm-conditions and transmitting information signals relating thereto to the master station by radio,

each remote unit having a basic radio transmission frequency which is nominally the same as that of each other of the remote units but is subject to drift over not more than a predetermined relatively broad bandwidth,

the master station comprising (a) receiving means having a narrow operating radio bandwidth, (b) sweeping means for sweeping the centre frequency of the narrow operating bandwidth over the predetermined broad bandwidth, (c) sweep-interrupting means responsive to detection of a received signal for temporarily stopping the sweep, (d) storage means operative in response to sweeping of the operating frequency of the receiving means over the said broad bandwidth to store those values of the receiver operating frequency at which signals are received by the receiving circuitry, and (e) means responsive to the stored frequency values to control the operation of the sweeping means during at least one subsequent sweep whereby the sweeping means carries out accelerated sweeps to within respective predetermined ranges each encompassing a respective one of the stored frequencies and is operative to carry out a normal sweep through each such range.

4,550,313

FIRE DETECTING SYSTEM

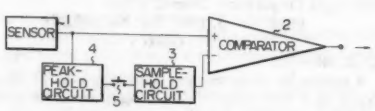
Tetsuo Kimura, Tokyo, Japan, assignor to Nittan Company, Limited, Tokyo, Japan

Filed May 19, 1983, Ser. No. 495,799

Claims priority, application Japan, Jun. 9, 1982, 57-097843

Int. Cl.⁴ G08B *17/00*

U.S. Cl. 340—584 **5 Claims**



1. A fire detecting systems comprising:

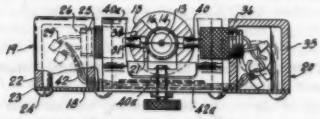
a sensor which outputs a voltage corresponding to smoke concentration, temperature or the like;
a comparator which compares the output voltage of the sensor with a reference voltage to produce a fire alarm when the output voltage of the sensor exceeds the reference voltage;
a peak-hold circuit which holds a peak voltage of the output of the sensor;
a sample-hold circuit which is capable of storing the output voltage of the peak-hold circuit to supply the stored voltage to the comparator as the reference voltage;
a switch means which is capable of transferring the output voltage of the peak-hold circuit to the sample-hold circuit.

4,550,314

METER MONITOR APPARATUS

Wallace I. Stenzel, Thiensville, and Kenneth R. Payne, Menomonee Falls, both of Wis., assignors to Waukee Engineering Company, Milwaukee, Wis.

Filed Sep. 7, 1982, Ser. No. 415,584
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—623 **7 Claims**



1. A monitoring device for signalling change in the position of a pointer immersed in an elongated transparent member filled with a light transmitting liquid, comprising a tubular guard for housing said transparent member and having first and second aligned elongated openings to the opposite sides of the guard, a light unit including a light transmitting barrel unit located to one side of said guard and extending into said first elongated opening, a photosensitive receiver unit located to the opposite side of said guard from said light unit, said photosensitive unit including a photoelectric transducer and including a receiving barrel unit extending into said second opening and aligned with said light transmitting barrel unit, each of said barrel units being similarly constructed with a housing and a recessed support section secured to the housing and a light carrying barrel extending outwardly from said support section into said first and second openings and terminating in close spaced relation to said transparent member, a light secured in the support section of the light transmitting barrel unit and the photoelectric transducer being secured in the support section of the receiving barrel unit, a common support for said housings of said light transmitting barrel unit and said receiving barrel unit, and releasable attachment means connecting said housings to said common support for movement along said transparent member.

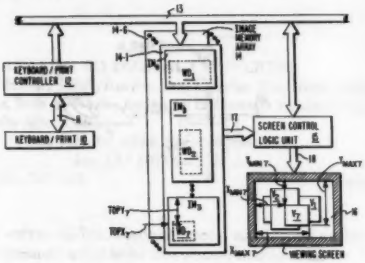
4,550,315

SYSTEM FOR ELECTRONICALLY DISPLAYING MULTIPLE IMAGES ON A CRT SCREEN SUCH THAT SOME IMAGES ARE MORE PROMINENT THAN OTHERS

Leland J. Bass, San Diego; Ashwin V. Shah, Encinitas, and Ralph O. Wickwire, San Diego, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Nov. 3, 1983, Ser. No. 548,552
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—703 **10 Claims**

1. A system for electronically displaying multiple images on a screen such that some of said images are more prominent than others; comprising:
a means for storing control signals which partition said screen into an array of blocks, define multiple prioritized viewports by indicating which blocks are included in each viewport, and correlate respective image pixels to each viewport;
a means for determining, from said control signals, the identity of the highest priority viewport to include a particular block;
a plurality of color map memories each of which contains a plurality of color signals;



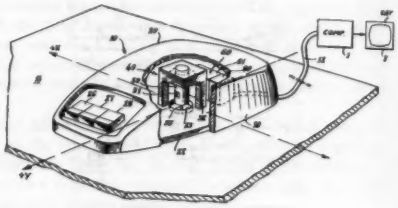
a means for addressing a particular color map memory of said plurality based on the identity of said highest priority viewport; and
a means for transferring respective color signals from said addressed color map memory to said screen based on the image pixels in said block of said highest priority viewport.

4,550,316

STYLUS MOUSE

Albert L. Whetstone, Stratford, and Kerry L. Shaklee, Fairfield, both of Conn., assignors to Display Interface Corp., Milford, Conn.

Filed Apr. 29, 1983, Ser. No. 489,828
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—710 **25 Claims**

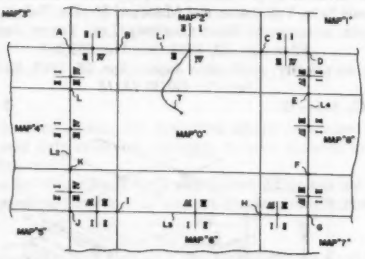


1. A mouse for producing signals indicative of its motion on a surface, comprising:
(A) a housing adapted for sliding movement on the surface;
(B) a stylus assembly mounted to said housing, including a stylus extending toward a surface and having a tip in contact with the surface, said stylus bending and vibrating during movement of the housing on the surface;
(C) transducer means sensing bending and vibration of the stylus during movement of the housing on the surface; and
(D) calculating means for deriving signals indicative of the direction and distance of movement of the housing on the surface, based on the sensed bending and vibration of the stylus during movement of the housing on the surface.

4,550,317
DRIVE GUIDE DISPLAY SYSTEM FOR MOTOR VEHICLE

Masakazu Moriyama, and Takao Saito, both of Aichi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 29, 1982, Ser. No. 427,534
Int. Cl.[4] G08G 1/12
U.S. Cl. 340—995 8 Claims



1. A drive guide system for a motor vehicle comprising:

(A) a travel distance sensor for detecting a travel distance of said motor vehicle;

(B) an azimuth sensor for detecting an azimuth of travel of said motor vehicle;

(C) memory means for storing map information of a plurality of sections of a drive route map of said motor vehicle form a start point to a destination point;

(D) a display for displaying one of said drive route map sections in accordance with the sectioned map information stored in said memory means and displaying position information of said motor vehicle between said start point and said destination point; and

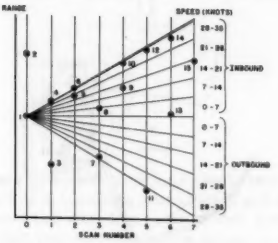
(E) a display control unit for causing said display to display said position information of said motor vehicle based on signals from said travel distance sensor and said azimuth sensor, and when the position of said motor vehicle displayed on said display reaches a predetermined position, selecting one of said sectioned map information corresponding to a route to be next followed by said motor vehicle based on coordinates on a display screen of said display and the signal from said azimuth sensor, reading the selected sectioned map information from said memory means and causing said display to display said selected sectioned map information;

wherein said drive route map section displayed on said display includes four first areas which overlap with the respective adjacent drive route map sections and four second areas which overlap with respective three surrounding drive route map sections, and when the position of said motor vehicle reaches any one of the outlines of the drive route map section being displayed on the display which defines any one of said first areas, one overlapping map section is selected in accordance with the azimuth of travel of said motor vehicle detected by said azimuth sensor, and when the position of said motor vehicle reaches one of the outlines which defines any one of said second areas, one of said three overlapping map sections is selected in accordance with the azimuth of travel of said motor vehicle detected by said azimuth sensor.

4,550,318
RETROSPECTIVE DATA FILTER

Richard J. Prengaman, Severna Park; Robert E. Thurber, Silver Spring; Joe Phipps, Westminster, all of Md.; Ronald I. Greenberg, Clayton, Mo.; Wai L. Hom, Washington, D.C.; James F. Jaworski, and Guy W. Riffle, both of Columbia, Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed Feb. 3, 1982, Ser. No. 345,325
Int. Cl.[4] G01S 13/04
U.S. Cl. 343—5 PD 46 Claims



33. A method for filtering position data relating to contacts detected by a scanning target detection system, the method comprising the steps of:

entering one set of position data after another into a multiscan memory;

identifying the position sector in which the contact corresponding to each set of position data is detected;

linking each set of entered position data to the most recent previous set of entered position data identified with the same position sector, wherein the linking comprises the step of:

generating at least one link chain, each chain linking a set of position data to previous sets of position data in a particular identified sector over a period of time;

comparing the position and timing of a particular set of position data in one particular sector to each other previous set of position data in the particular corresponding chain and defining a velocity relative to each such comparison; and

comparing each defined velocity with a predefined maximum velocity number (V_{max}) and a predefined minimum velocity number (V_{min}), V_{min} and V_{max};

bracketing the likely velocities of target;

rejecting as an indicator of a probable presence of a target each contact which, when compared to the contact of interest, provide an encoded velocity number that is either less than V_{min} or more than V_{max}.

4,550,319
REFLECTOR ANTENNA MOUNTED IN THERMAL DISTORTION ISOLATION

Eugene R. Ganssle, Skillman, and Claude P. Miller, West Deptford, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Sep. 22, 1982, Ser. No. 421,466
Int. Cl.[4] H01Q 3/02
U.S. Cl. 343—882 12 Claims

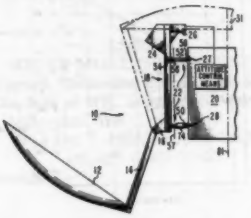
1. A system for mounting an antenna including a reflector and feed means to a support structure such that distortions in the support structure due to temperature excursions do not degrade antenna performance comprising:

a thermally stable, relatively stiff support member which has negligible distortion in the presence of said temperature excursion;

said reflector and said feed means secured to said member with said feed means located at the focus of said reflector; and

means coupled to said member for securing said member in

distortion isolation to said support structure such that said member tilts as a unit relative to said support structure rather than distorts in response to distortion in said support structure, said means for securing including means for securing said member to said support structure at effectively three spaced locations, said means for securing including at (1) the first of said locations ball joint means for permitting relative rotation of said member to said structure in response to said distortion and for resisting displacement of said member relative to said support structure in any of three orthogonal directions, (2) at the



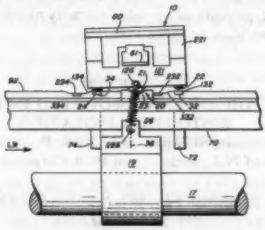
second location means for resisting displacement of said member relative to said support structure in one of said three orthogonal directions normal to said member and for permitting relative displacement of said member in at least one of the other two orthogonal directions in response to said distortion, and (3) at the third location means for resisting displacement of said member relative to said support structure in the one direction and in a direction normal to the one direction and to a line through the first and third locations and permitting relative displacement of the member in the third orthogonal direction in response to said distortion.

4,550,320

CARRIAGE-MOUNTED VELOCITY MULTI-DEFLECTION COMPENSATION FOR BI-DIRECTIONAL INK JET PRINTERS

Roger W. Biser, and Joseph E. Mishark, both of Rochester, Mich., assignors to Centronics Data Computer Corp., Hudson, N.H.

Filed Oct. 31, 1983, Ser. No. 547,426
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—75 **20 Claims**



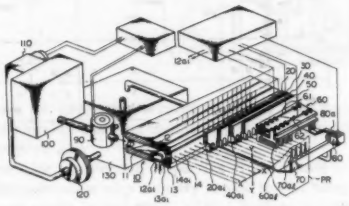
1. An ink jet printer comprising:
a nozzle for emitting a stream of ink drops along a predetermined path;
a charging electrode for charging the ink drops;
means for forming an electric field for deflecting ink drops passing thereby;
a print receiving medium for receiving ink drops;
carriage means driven in a bidirectional manner traversely of said print receiving medium and supporting said nozzle, charging electrode, and deflecting means thereon;
pivoted tilt means having a fulcrum coacting with said carriage means and mounted on said carriage means, said tilt means supporting said deflection means so that the deflection means can be mechanically tilted in a manner to compensate for an inclination of ink drop images which would be formed by the drops by movement of said carriage means if not compensated for; and
moveable mechanical stop means coperatively associated with said tilt means for providing different tilt compensation for different traverse speeds of said carriage means.

4,550,321

CHARGED INK-PRINTER DROPLET DETECTION

Tsutomu Sato, Yokohama, and Masanori Horike, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 23, 1984, Ser. No. 603,261
Claims priority, application Japan, Apr. 25, 1983, 58-72746
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—75 **5 Claims**



1. A device for detecting charged ink drop in an ink jet printer, comprising:
a charge detecting electrode for detecting a charged ink drop;
integration means provided with an integrator for integrating a detection signal output from said charge detecting electrode, said integration means being further provided with resetting means, said integration means clearing an integrated value within a first period of time;
notification means for generating an recognizable notification when energized for a second period of time which is longer than said first period of time;
a control signal conductor connecting to a reset signal input terminal of the resetting means of the integration means and an energizing signal input terminal of the notification means; and
control means for applying a reset command signal having a duration which is longer than said first period of time and shorter than said second period of time, temporarily in the event of charge detection.

4,550,322

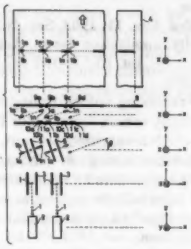
DROP SENSOR FOR AN INK JET PRINTER

Masayoshi Tamai, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Apr. 18, 1984, Ser. No. 601,466
Claims priority, application Japan, May 7, 1983, 58-79665
Int. Cl.[4] G01D *15/18*; G02B *5/14*
U.S. Cl. 346—75 **10 Claims**

1. A drop sensor for an ink jet printer for detecting the positions of ink drops emitted from a drop generator as the ink drops move toward a recording medium, the drop sensor comprising:
a plurality of light emitting elements aligned in a linear array for emitting light beams which cross in pairs in the region where the ink drops move, each point of crossing in said region comprising a matrix point therein;
a plurality of light receiving elements aligned in a linear array for receiving said light beams and for generating signals having magnitudes corresponding to the intensities

of said received light beams, said linear array of light emitting elements and said linear array of light receiving elements being aligned and opposed with each other, the coincidence of an ink drop and one of said matrix points in



said region causing the generated signals of selected ones of said light receiving elements to have reduced magnitudes; and

means for determining from said generated signals the two-dimensional positions of said ink drops in said region.

4,550,323

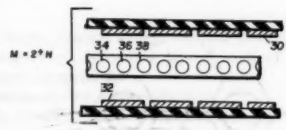
ELONGATED FLUID JET PRINTING APPARATUS

Rodger L. Gamblin, Dayton, Ohio, assignor to Burlington Industries, Inc., Greensboro, N.C.

Continuation-in-part of Ser. No. 393,698, Jun. 30, 1982, abandoned. This application Jun. 7, 1983, Ser. No. 502,785

Int. Cl.⁴ G01D *15/18*

U.S. Cl. 346—75 **20 Claims**



1. An elongated fluid jet printing apparatus having an enhanced printing resolution potential and an average pixel width capability of approximately L/N, said apparatus comprising:

a first elongated array of fluid jet orifices for individually passing fluid jet filaments therethrough and having M fluid jets per unit L of length substantially greater than 100 orifices per inch; and

a second elongated array of individual charging electrodes positioned downstream and offset to one side of said first array for electrically charging fluid droplets as they break away from said fluid filaments, there being N of said charging electrodes per unit L of length of at least 100 electrodes per inch where the number M is substantially greater than the number N and where there is no element-by-element alignment between said first and second arrays and there are varying ratios between each electrode and its adjacent orifices along the length L.

4,550,324

INK TRANSFER THERMAL PRINTER

Munetaka Tamaru, and Naomichi Suzuki, both of Tokorozawa, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Jul. 15, 1983, Ser. No. 514,225

Claims priority, application Japan, Jul. 16, 1982, 57-123930; Aug. 10, 1982, 57-138964; Sep. 21, 1982, 57-163230; Feb. 24, 1983, 58-28524; Mar. 4, 1983, 58-34345; Jun. 14, 1983, 58-104947

Int. Cl.⁴ B41J *3/20*

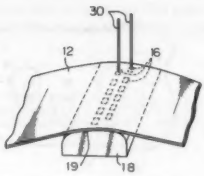
U.S. Cl. 346—76 PH **20 Claims**

1. An ink transfer printer, comprising:

thermo-sensitive ink which is solid at normal room temperature, in the form of at least one member having a coherent mass of predetermined shape;

recording paper and means for transporting said recording paper past said at least one ink member in close proximity thereto;

printing means operable to melt a portion of said one ink



member at a position in close proximity to said recording paper, such as to transfer at least a part of said melted ink portion onto said recording paper to form a printed dot thereon, said transportation means acting to move said recording paper relative to said printing means such that desired patterns of said thermo-sensitive ink dots are formed on said recording paper.

4,550,325

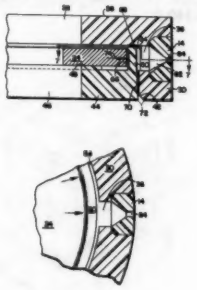
DROP DISPENSING DEVICE

Michael S. Viola, Burlington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 26, 1984, Ser. No. 686,454

Int. Cl.⁴ G01D *15/18;* **B67D** *5/00;* **B05B** *17/06;* **H01L** *41/04*

U.S. Cl. 346—140 R **30 Claims**



1. A drop dispensing device comprising:

means defining a planar electroactuator bounded by a peripherally circumferential surface;

means defining a fluid receiving chamber having at least a first plastic resin wall connected to said peripherally circumferential surface of said electroactuator and a second wall spaced from said first wall; and

nozzle means in fluid communications with said fluid receiving chamber,

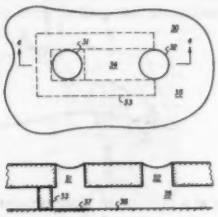
said planar electroactuator applying a peripherally circumferentially directed force to said first wall in response to electrical excitation to cause a predetermined quantity of fluid to be ejected through said nozzle in a drop-wise manner.

4,550,326

FLUIDIC TUNING OF IMPULSE JET DEVICES USING PASSIVE ORIFICES

Ross R. Allen, Ramona, and Daniel E. Allen, Escondido, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 2, 1983, Ser. No. 490,753
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R 4 Claims



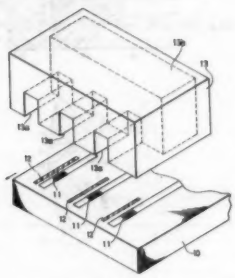
1. An improved impulse jet device of the type in which a fluid is supplied from a source of fluid to at least one emitter, each emitter having means for ejecting droplets of ink through an associated nozzle in a nozzle plate, said nozzle plate including at least one non-emitting orifice adjacent to each of the nozzles, wherein, in the improved impulse jet device, at least one of the non-emitting orifices is an emitter and said improvement comprises means for inactivating the emitter which is to serve as a non-emitting orifice.

4,550,327

DEVICE FOR DISCHARGING LIQUID DROPLETS

Akira Miyakawa, Tanashi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 453,159, Dec. 27, 1982, abandoned. This application Oct. 10, 1984, Ser. No. 659,504
Claims priority, application Japan, Jan. 8, 1982, 57-933
Int. Cl.[4] G01D *15/18*; H01C *7/06*
U.S. Cl. 346—140 R 6 Claims



1. A device for discharging liquid as liquid droplets, comprising:

at least one nozzle for providing a liquid flow path;

heating means for applying thermal energy to an area of said nozzle; and

means for detecting the absence of liquid in said area, including a conductive element having an electrical conductivity that varies according to the temperature of said conductive element, said conductive element being disposed proximate to said area for detecting changes in the temperature thereof in accordance with changes in the electric current passing through said conductive element.

4,550,328

IMAGE-RECEIVING COLOR-FORMING SHEET FOR TRANSFER ELECTROPHOTOGRAPHY

Takao Kosaka, Himeji, and Hirokazu Tsukahara, Takasago, both of Japan, assignors to Mitsubishi Paper Mills, Limited, Tokyo, Japan

Filed Aug. 11, 1983, Ser. No. 522,214
Claims priority, application Japan, Aug. 23, 1982, 57-146687
Int. Cl.[4] B41M *5/22*
U.S. Cl. 346—201 7 Claims

1. An image-receiving color-forming sheet for transfer-type electrophotography which forms color from colorless sublimable dyes and which comprises a support, a color forming layer free of dye and containing an electron accepting material provided on the support and a transparent and gas-permeable high-resistivity layer which contains as a dielectric substance a self-emulsifiable resin mainly composed of acrylate ester and/or methacrylate ester.

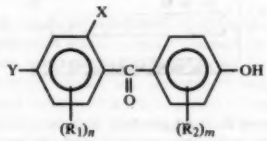
4,550,329

HEAT SENSITIVE RECORD MATERIAL

Michihiro Gonda, Kitamoto; Katsumasa Kitsukawa, Tokyo; Susumu Suzuka, Yono; Mikiko Kanasugi; Yutaka Sato, both of Tokyo, and Kikuo Otomo, Toride, all of Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan

Filed Aug. 31, 1984, Ser. No. 646,091
Claims priority, application Japan, Sep. 30, 1983, 58-180474; Jul. 6, 1984, 59-138890
Int. Cl.[4] B41M *5/18*
U.S. Cl. 346—214 9 Claims

1. A heat sensitive record material comprising at least one colorless or light-colored electron donative dyestuff and at least one color developing agent represented by the general formula:



(I)

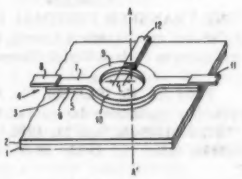
where each of R_1 and R_2 is a hydrogen atom, an alkyl group having from 1 to 5 carbon atoms, an alkoxy group having from 1 to 5 carbon atoms or a halogen atom, X is an alkyl group having from 1 to 5 carbon atoms or a halogen atom, Y is a hydroxyl group, an alkyl group having from 1 to 5 carbon atoms or a halogen atom, n is an integer of 1 to 3, and m is an integer of 1 to 4.

4,550,330

SEMICONDUCTOR INTERFEROMETER

Alan B. Fowler, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1984, Ser. No. 626,499
Int. Cl.[4] H01L *29/161*
U.S. Cl. 357—16 9 Claims



1. A signal translating device comprising in combination

a semiconductor crystal having a region of a first band gap semiconductor epitaxially joined and forming a heterojunction with a second semiconductor having a second smaller band gap,

a conducting path essentially coplanar with said heterojunction having bifurcated signal paths, each said bifurcated path length being of the order of several mean free paths of an electron in said semiconductor, and

means for impressing a localized electric field on said heterojunction under one of said bifurcated signal paths.

4,550,331

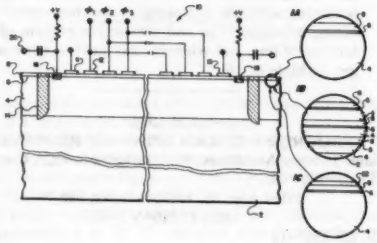
MULTILAYER MODULATION DOPED HETEROSTRUCTURE CHARGE COUPLED DEVICE

Raymond A. Milano, Newbury Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 29, 1983, Ser. No. 518,786

Int. Cl.[4] H01L *29/78, 29/56, 29/205, 29/80*

U.S. Cl. 357—24 **6 Claims**



1. A heterojunction charge coupled device comprising:

a plurality of alternating layers, each of said alternating layers comprising:

an undoped, first semiconductor;

a thin, epitaxial spacer layer of an undoped second semiconductor on said first semiconductor, said second semiconductor having a wider band gap than said first semiconductor;

a n^+ doped epitaxial layer of a third semiconductor on said thin, epitaxial spacer layer, said third semiconductor having the same band gap as said second semiconductor; and

a charge coupled device gate structure on said n^+ doped layer of the uppermost of said alternating layers.

4,550,332

GATE CONTROLLED SEMICONDUCTOR DEVICE

Siegfried Wagner, Karl-Marx-Stadt, German Democratic Rep., assignor to Veb Zentrum für Forschung und Technologie Mikroelektronik, Dresden, German Democratic Rep.

Continuation-in-part of Ser. No. 316,603, Oct. 30, 1981, abandoned. This application Nov. 9, 1981, Ser. No. 319,369

Claims priority, application German Democratic Rep., Oct. 30, 1980, 224827

Int. Cl.[4] H01L *29/78, 29/74*

U.S. Cl. 357—38 **10 Claims**

1. A gate controlled semiconductor device comprising:

a support element;

a semiconductor substrate of first conductivity type disposed on the support element and defining a top surface; said substrate having a V- or U-shaped recess protruding from the top surface;

a first insulating layer covering the recess;

an electrically conducting layer disposed on the first insulating layer for forming a gate;

a second insulating layer covering the top surface of the semi-conductor substrate and having at least two openings;

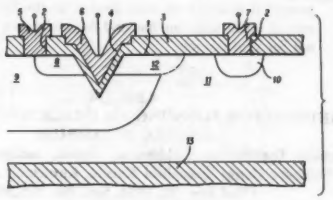
a first ohmic contact disposed at one opening located at one side relative to the gate;

a first electrode connected to the first ohmic contact;

a first semiconductor region of first conductivity type but having a larger concentration of majority carriers than the substrate, said first semi-conductor region being disposed in contact with the first ohmic contact and extending up to the neighboring side of said recess in the semiconductor;

a second ohmic contact disposed at a second opening located at the second side relative to the gate;

a second electrode connected to the second ohmic contact;



a second semiconductor region of second conductivity type but having a larger concentration of carriers than the substrate and being adjacent to the second ohmic contact;

said substrate extending at least to the proximity of the opposite side of the recess;

a channel region having, in the absence of electrical fields, second conductivity type and being disposed adjacent and below the tip of the recess, adjacent to the substrate, to the first semiconductor region, and to a portion of the first ohmic contact.

4,550,333

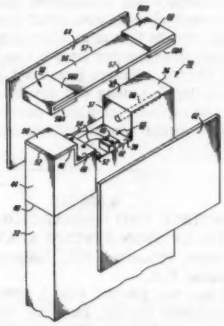
LIGHT EMITTING SEMICONDUCTOR MOUNT

Robert A. Ridder, Brookdale, and Joseph C. Tramontana, San Jose, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 13, 1983, Ser. No. 531,562

Int. Cl.[4] H01S *3/19;* **H01L** *33/00*

U.S. Cl. 357—81 **10 Claims**



1. A light emitting semiconductor mount comprising a metal heat sink support, said support having a top surface partioned into three steps comprising an upper step, a central step and a lower step, a light emitting semiconductor device mounted on said central step, a dielectric block mounted in said lower step, said block having a top surface with two steps, a lower step adjacent said central step and an upper step, a metal film deposited on said block top surface, means for electrically coupling one terminal of said light emitting semiconductor device to said block lower step, the other terminal of said light emitting

semiconductor device comprising said heat sink support, the improvement comprising

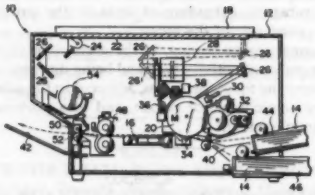
a dielectric flat bar having one end secured to the surface of said block upper step and the other end thereof secured to the surface of said support upper step, the length and width of said bar being substantially the same as the width and depth of said support, at least one end of said dielectric bar is provided with a metal film on its flat surfaces with electrical continuity provided between said metalized end surfaces at said one bar end, said one bar end being secured to the surface of said block upper step and the other end thereof secured to the surface of said support upper step, said bar providing a shield to prevent potential damage to said device in the handling of said mount while said one bar end functions as a leadout terminal for said device.

4,550,334

METHOD FOR FORMING AN IMAGE BY THE USE OF AN IMAGE CARRIER

Kenshi Toshimitsu, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 30, 1984, Ser. No. 575,388
Claims priority, application Japan, Jan. 31, 1983, 58-13998
Int. Cl.⁴ G03G *15/00*
U.S. Cl. 355—3 R **6 Claims**



1. A method of sequentially forming a series of images on an image carrier whose resistance is changed by exposure comprising the steps of:

exposing said image carrier with an image, thereby forming a latent image in accordance with a change of resistance;

charging said image carrier after said exposing step to form an electrostatic latent image from said latent image;

developing said electrostatic latent image formed in said charging step, the time interval between said charging and developing steps ranging from 0.4 to 1.0 seconds;

removing electric charges from said image carrier, said removing step following said developing step; and

repeating said exposing, charging, developing and removing steps in the order named with respect to others of said images.

4,550,335

COMPATIBLE AND HIERARCHICAL DIGITAL TELEVISION SYSTEM STANDARD

Kerns H. Powers, Princeton, N.J., assignor to RCA Corporation, Princeton, N.J.

Division of Ser. No. 230,384, Feb. 2, 1981, abandoned. This application Aug. 26, 1982, Ser. No. 411,905
Int. Cl.⁴ H04N *5/02*
U.S. Cl. 358—11 **18 Claims**

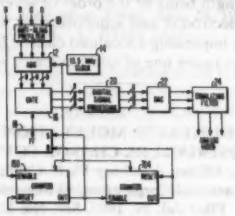
1. A television signal sampling system, comprising:

clock signal generating means for generating 13.5 MHz clock signals;

a source of television signals, said television signals being organized into recurrent horizontal lines, each of said horizontal lines having a horizontal line interval including an active portion in which video information is carried and a non-active portion, and also including horizontal synchronizing information in said non-active portion;

means coupled to said clock signal generating means and to said source of television signals for sampling said television signal; and

selecting means for selecting a fixed number of samples from horizontal lines of said television signals, wherein said fixed number of samples are from that portion of said



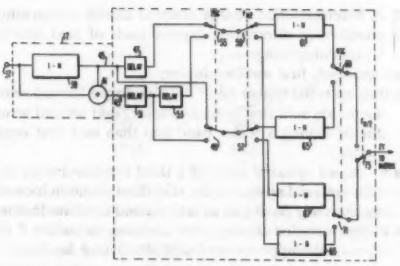
television signal occurring during said active portion of said horizontal line interval but not including samples occurring after the beginning of said horizontal synchronizing information in said non-active portion of a given horizontal line, and wherein said fixed number is an integer multiple of 16.

4,550,336

PROGRESSIVE SCAN SPEED-UP PROCESSOR

Walter E. Sepp, Middlesex, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 26, 1983, Ser. No. 526,701
Int. Cl.⁴ H04N *5/02*
U.S. Cl. 358—11 **11 Claims**



1. In a color television sytem for producing a progressively scanned image, an apparatus comprising:

a source of television signals, having a first data sequence, representing luminance and chrominance information of an image raster-scanned in an interlaced fashion;

time-compression means coupled to said source of television signals for reducing the time duration of each line of said television signals by a first predetermined factor forming speeded-up television signals; and

display means, coupled to receive said speeded-up television signals, for displaying, by progressive scanning, lines of video derived from said time-compression means;

wherein said time-compression means includes:

input sequence means coupled to receive said source of television signals for providing a data stream having a second data sequence rearranged from said first data sequence;

storage means, coupled to receive said data stream, for storing said data stream in said rearranged second data sequence; and

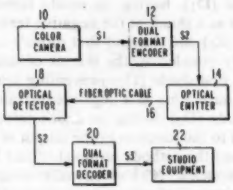
output sequence means coupled to receive said data stream from said storage means for restoring the data stream to said first data sequence and for providing said speeded-up

television signals, having said first data sequence, to said display means.

4,550,337
DIGITAL VIDEO TRANSMISSION SYSTEM

Robert A. Dischert, Burlington; Warren H. Moles, Flemington; Roland N. Rhodes, Belle Mead, and James M. Walter, Columbus, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 7, 1983, Ser. No. 482,821
Int. Cl.[4] H04N 9/32
U.S. Cl. 358—13 18 Claims



1. An encoder for providing serial synchronous digital transmission of a video input signal, comprising:

input means responsive to said video input signal for providing a color subcarrier reference signal, a synchronizing level identification signal and a run length limited NRZ encoded video output signal;

circuit means responsive to said subcarrier reference signal for providing a PCM encoded signal representative thereof;

an output node;

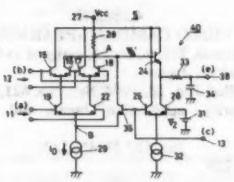
second circuit means responsive to said synchronizing level identification signal for selectively coupling said NRZ and PCM encoded signals to said output node to provide a resultant digital output signal; and wherein:

said PCM encoded signal comprises sequential blocks of words, each word having a predetermined binary value not contained in any word of said NRZ encoded signal.

4,550,338
DETECTING CIRCUIT

Kenji Kojima, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 23, 1983, Ser. No. 468,881
Claims priority, application Japan, Apr. 22, 1982, 57-69012
Int. Cl.[4] H04N 9/46
U.S. Cl. 358—20 18 Claims



1. A detecting circuit, comprising:

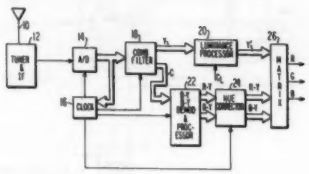
synchronous detecting means having a first input portion receiving a signal to be detected, a second input portion receiving a carrier wave, a constant current source junction coupled to a constant current source and a detected signal output portion for providing a detected signal, and for synchronously detecting said signal to be detected as a function of said carrier wave, and

switching means coupled to said detected signal output portion and said constant current source junction and responsive to an externally provided switching signal for short-circuiting said detected signal output portion and said constant current source junction.

4,550,339
BINARY DIVIDER AS FOR A DIGITAL AUTO FLESH CIRCUIT

Russell T. Fling, Noblesville, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 21, 1983, Ser. No. 554,082
Int. Cl.[4] H04N 9/535
U.S. Cl. 358—28 14 Claims



13. A method of dividing the magnitude of a binary dividend sample by the magnitude of a larger binary divisor sample comprising the steps of:

A. multiplying the dividend by two and subtracting the divisor from the multiplied dividend to generate a difference including a sign bit;

B. Complementing the sign bit and arranging it as the LSB of a partial quotient;

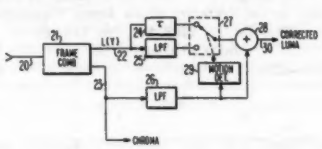
C. generating a modified dividend equal to the magnitude of the difference if the difference is positive and equal to the multiplied dividend less its MSB if the difference is negative.

D. repeating steps A, B and C using the modified dividend, N-1 times to generate an N-bit quotient.

4,550,340
APPARATUS FOR FRAME-TO-FRAME COMB FILTERING COMPOSITE TV SIGNAL

Warren H. Nicholson, Plainsboro, and Dalton H. Pritchard, Princeton Township, Mercer County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Feb. 6, 1984, Ser. No. 577,506
Int. Cl.[4] H04N 9/535, 5/21
U.S. Cl. 358—31 8 Claims



5. Circuitry for correcting motion induced signal distortion in comb filtered luminance signal derived from a frame-to-frame comb filter, which provides comb filtered luminance signal and comb filtered chrominance signal, comprising:

a first low pass filter responsive to said comb filtered chrominance signal for substantially rejecting signal in the frequency band occupied by chrominance signal;

a second low pass filter responsive to said comb filtered luminance signal and having a frequency response similar to said first low pass filter; and

signal combining means having an output terminal at which corrected luminance signal is available, and having first and second input terminals coupled to respective output

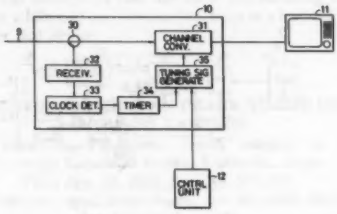
terminals of said first and second low pass filters respectively.

4,550,341

UNAUTHORIZED OBSERVATION PREVENTING DEVICE FOR CATV SYSTEM

Akihiko Naito, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 3, 1982, Ser. No. 404,736
Int. Cl.⁴ H04N 7/16; H04K 1/00
U.S. Cl. 358—114 **6 Claims**



1. In a cable television system in which a central facility is connected through cables to a number of terminal units and communication is effected between said central facility and said terminal units, an unauthorized observation-preventing device, characterized by comprising:

detecting means at each terminal unit for detecting when a particular signal from said central facility is received satisfactorily; and

stopping means at each terminal unit for stopping the operation of a television set when said detecting means determines that said particular signal is not received satisfactorily;

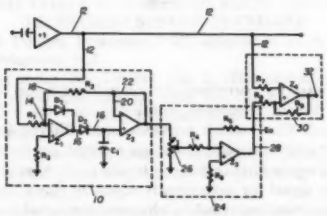
said stopping means including a timer for providing a control signal to a tuning signal generator a predetermined period of time after the absence of said particular signal is detected whereby a tuning signal from said tuning signal generator is then automatically generated for operating a channel conversion means to enable reception of a preselected channel.

4,550,342

HORIZONTAL SYNC DETECTOR

James E. Buchanan, Bowie, and John M. Shipley, Pasadena, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 28, 1983, Ser. No. 518,169
Int. Cl.⁴ H04N 5/08
U.S. Cl. 358—153 **6 Claims**



1. An improved horizontal sync detector circuit for use in high resolution digital processing of a video data signal which comprises:

negative peak detector circuit means for having sensitivity only to the negative peaks of said video data signal, which stores a voltage potential representing the largest signal value of said video data signal it received, and for allowing a reference point to be established despite changes in video data signal values and changes caused by range in ambient temperatures; said negative peak detector means comprising:

a first stage operational amplifier (Z_1);

a first scaling resistor (R_1) having a first end electrically connected to said video signal and another end coupled to the negative input terminal of said amplifier (Z_1);

a biasing resistor (R_3) which electrically couples the positive input of said first emplifier (Z_1) to ground connection means;

a first diode (D_1), having its anode terminal electrically connected as a shunt, at the negative terminal of said first amplifier (Z_1) and the said first diode's cathode terminal electrically coupled to the output of said first amplifier (Z_1), said first diode (D_1) preventing said first amplifier (Z_1) from saturating in a negative direction;

a second diode (D_2) having an anode terminal electrically connected to the junction of the output of said first amplifier (Z_1) and the cathode terminal of said first diode (D_1);

a storage capacitor (C_1) electrically coupled between a cathode terminal of said second diode (D_2) and ground, said second diode (D_2) allowing said capacitor (C_1) to be driven in one direction only;

a second stage operational amplifier (Z_2) having a positive terminal electrically connected to a common junction between said capacitor (C_1) and said cathode terminal of said second diode (D_2), and a negative input terminal; and

a second scaling resistor (R_2) having one end electrically connected to the negative input terminal of said second amplifier (Z_2) and to the output of said second amplifier (Z_2), and the other end to the negative input terminal of said first amplifier (Z_1), said first and second scaling resistors completing the feedback paths around said first and second amplifiers (Z_1) and (Z_2) respectively, for determining the throughput gain;

proportioning amplifier circuit means having input means electrically coupled to the output of said peak detector means for setting a triggering point at a specified point above the negative peaks of a horizontal sync pulse, and for constantly adjusting said triggering point of said detector means to be dependent upon the signal level of said video data signal and proximate to the center level of said horizontal sync pulse; and

comparator circuit means electrically coupled to the output of said proportioning amplifier means and the input video data signal for stripping away the video data signal and converting the video sync information thereof to a TTL logic level.

4,550,343

VIDEO CAMERA APPARATUS

Nobuyuki Nakatani, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 15, 1984, Ser. No. 621,047
Claims priority, application Japan, Jul. 15, 1983, 58-109877[U]
Int. Cl.⁴ H04N 5/26
U.S. Cl. 358—229 **21 Claims**

1. A video camera apparatus comprising:

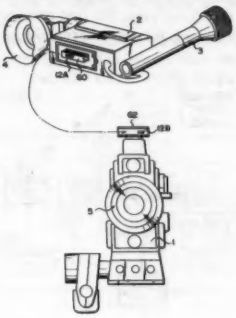
a video camera main body for providing a video signal corresponding to an optical image to be photographed;

an electronic view finder detachably mounted on said video camera main body in a normal or reverse posture, for displaying a picture corresponding to said video signal;

microphone means fixed to said electronic view finder, for providing stereophonic signals to be supplied to a stereo recording apparatus which is adapted to the video camera apparatus, said stereophonic signals containing left and right information regarding a stereophonic effect; and

switch means coupled to said video camera main body, said

electronic view finder and said microphone means, for electrically reversing top/bottom portions of the picture displayed in said electronic view finder and exchanging



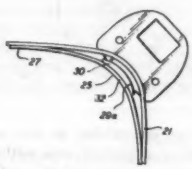
the left and right information of said stereophonic signals when said electronic view finder is mounted on said video camera main body in said reverse posture.

4,550,344

CATHODE RAY TUBE WITH COMPOSITE MOUNTING STRUCTURE

Michael J. Buckley, Geneva, N.Y., assignor to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Sep. 27, 1982, Ser. No. 423,909
Int. Cl.[4] H04N *5/645*
U.S. Cl. 358—248 **3 Claims**



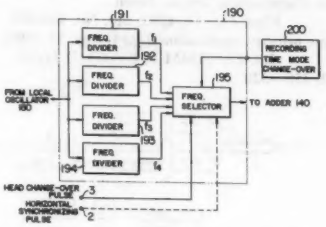
1. A cathode ray tube with a composite mounting structure, the tube comprising a glass face panel with four corner regions and a peripheral skirt portion integrally formed therewith, a metal tension band surrounding the face panel skirt and placing such skirt in mechanical compression, a fiber reinforced double-sided adhesive tape around the periphery of the face panel skirt under the tension band, and four L-shaped mounting brackets between the tape and the tension band, one bracket in each corner region of the face panel, each bracket comprising a base portion and an upstanding attachment portion, characterized in that said structure includes a resilient material located at least between the base portion of the mounting brackets and the relatively thinner, relatively non-compressive tape.

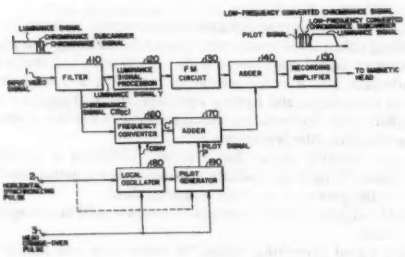
4,550,345

MAGNETIC VIDEO PILOT SIGNAL RECORDING/REPRODUCING SYSTEM

Toshimichi Terada, Chigasaki; Tomomitsu Kuroyanagi, Katsuta; Noboru Kozima, Yokohama, and Akira Shibata, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 8, 1982, Ser. No. 447,797
Claims priority, application Japan, Dec. 9, 1981, 56-196775; Dec. 9, 1981, 56-196777; Jan. 11, 1982, 57-1828; Jan. 11, 1982, 57-1830; Jan. 11, 1982, 57-1835; Jan. 11, 1982, 57-1838
Int. Cl.[4] H04N *5/92*
U.S. Cl. 358—323 **11 Claims**





1. A magnetic recording system comprising:

video signal processing means including a separating circuit for separating at least one of a luminance signal and a chrominance signal from a video signal, a frequency-modulating circuit for receiving said luminance signal and for frequency-modulating said received luminance signal, frequency converting means for receiving said chrominance signal and for converting a frequency of said received chrominance signal into a low-frequency band, and mixing circuit means for mixing said frequency-modulated luminance signal and said low-frequencyconverted chrominance signal so as to provide a video signal for recording;

recording means for recording said video signal from said video signal processing means onto a magnetic tape, said recording means including at least a first and second rotary magnetic head for forming recording tracks for at least a first and a second channel in an oblique direction on said magnetic tape and for recording field video signals of said first and second channels onto said first and second channel recording tracks:

pilot signal generating means for generating a pilot signal;

means for adding said pilot signal from said pilot signal generating means to said video signal from said video signal processing means to be multiplexed with said video signal;

said video signal processing means further including reference signal generating means for generating a reference signal having a frequency which is an integer multiple of

a chrominance subcarrier of said low-frequencyconverted chrominance signal; and

said pilot signal generating means being coupled with said reference signal generating means and including frequency dividing means for frequency-dividing said reference signal from said reference signal generating means to produce a low-frequency pilot signal.

4,550,346

MAGNETO-OPTIC INFORMATION RECORDING SYSTEM

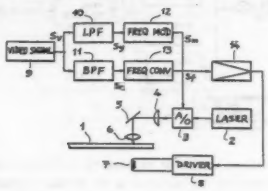
Hideki Hatano, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 14, 1983, Ser. No. 484,998

Claims priority, application Japan, Apr. 15, 1982, 57-062865

Int. Cl.⁴ H04M *9/491*; G11B *11/00*

U.S. Cl. 358—330 **4 Claims**



1. A magneto-optic information recording system for recording colorplexed composite video information containing a luminance signal component with a predetermined frequency bandwidth and a color subcarrier carrying a chrominance signal component and having a predetermined frequency on a magneto-optic information storage medium having a normal magnetization film, comprising

beam emitting means for emitting therefrom a recording beam of light to irradiate said normal magnetization film in the presence of a bias magnetic field;

field induction means operative to induce said bias magnetic field;

first signal extracting means for extracting said luminance signal component from said composite video information;

modulating means for modulating said recording beam of light in accordance with the luminance signal component extracted by said first signal extracting means;

second signal extracting means for extracting the chrominance signal component from said composite video information;

frequency converting means for converting the chrominance signal component into a signal with a predetermined frequency lower than the frequency of said color subcarrier; and

field control means which is responsive to the frequency-converted chrominance signal component produced by said frequency converting means and which is operative to vary said bias magnetic field in accordance with the frequency-converted chrominance signal component while the normal magnetization film is being irradiated with said modulated beam of light.

4,550,347

METHOD FOR RECORDING INFORMATION ON A RECORDING DISC

Shozo Nakamuta, Tokorozawa, Japan, assignor to Pioneer Video Corporation, Yamanashi, Japan

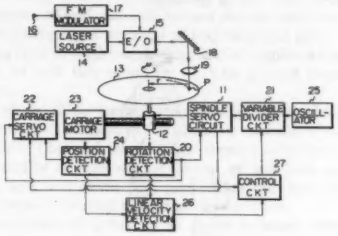
Filed Apr. 7, 1983, Ser. No. 482,725

Claims priority, application Japan, Apr. 7, 1982, 57-057782

Int. Cl.⁴ H04N *5/76*

U.S. Cl. 358—338 **14 Claims**

1. A method for recording an information signal on a recording disc having a first portion of recording tracks in which said information signal is recorded on said recording disc under a condition that the angular velocity of rotation of the disc is constant, and having a second portion of recording tracks in which said information signal is recorded on said recording disc under a condition that the angular velocity of rotation of said recording disc is varying, the first and second portions of recording tracks being formed alternately so as to be interspersed, the improvement comprising the steps of forming the first portion of the recording tracks with a space between each track having a first constant value, and forming the second portion of the recording tracks with a space between each track having a second constant value that is greater than said first constant value whereby crosstalk between adjacent tracks is avoided.



4,550,348

VIDEO DISC PLAYER SKIP/ARM SERVO SYSTEM

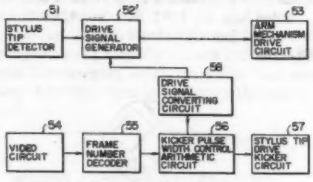
Yosinobu Imada, and Akio Nakashima, both of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 20, 1985, Ser. No. 544,115

Claims priority, application Japan, Oct. 20, 1982, 57-182818

Int. Cl.⁴ H04N *5/76*; G11B *21/10*

U.S. Cl. 358—342 **1 Claim**

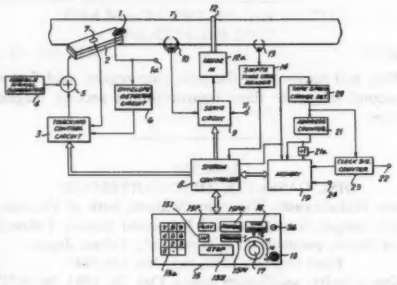


1. A video disc player comprising an arm servo system having means for driving a pickup arm with a cartridge mounted thereon to move in parallel with the surface of a disc, and a kicker drive system having means for driving a stylus tip mounted on said cartridge to be kicked in proportion to the width of a kicker drive pulse on the basis of the information from a picture signal processing circuit of said pickup arm, said video disc player characterized by the provision of a drive signal converting circuit having an input terminal to which said kicker drive pulse is applied and an output terminal from which a detected output signal is produced when said drive signal converting circuit detects that the width of said kicker drive pulse exceeds a predetermined value, and a drive signal generating circuit having an input terminal connected to said output terminal of said drive signal converting circuit, and which is responsive to said detected output signal to produce a drive signal for changing a balanced position of said stylus tip.

4,550,349
PLAYBACK SPEED CONTROLLER FOR VIDEO TAPE RECORDER

Yoshikazu Okuyama, Saitama, and Hajime Takeuchi, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 23, 1983, Ser. No. 478,141
Claims priority, application Japan, Mar. 30, 1982, 57-51673
Int. Cl.[4] G11B *19/26, 27/02*
U.S. Cl. 360—10.2 15 Claims



1. An information signal reproducing apparatus for use with a magnetic tape, comprising:

transducer means for reproducing information signals recorded in slant tracks on said tape;

tape transport means for driving said tape at controllably varied transport speeds;

means for selectively generating a plurality of varied tape speed signals indicative of respective varied transport speeds of said tape;

means for selectively generating a plurality of varied time duration signals indicative of varied time periods during which said tape is driven at selected ones of said varied transport speeds;

means receiving said plurality of tape transport speed signals and said plurality of varied time duration signals for associating a speed signal with a duration signal to form a plurality of selected pairs;

memory means connected to said means for associating for storing said plurality of selected pairs of tape speed signals and duration signals at corresponding addresses therein; and

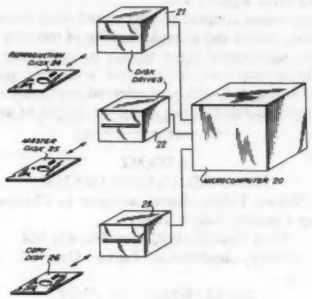
system control means connected to address said memory means to read out said plurality of selected pairs of signals for controlling said tape transport means in response thereto to drive said tape at speeds and for durations determined by said plurality of selected pairs of tape speed signals and duration signals read from said memory means.

4,550,350
SECURE COPY METHOD AND DEVICE FOR STORED PROGRAMS

Raymond J. Billings, Aurora, Colo., assignor to Software Distribution Newtork, Inc., Aurora, Colo.

Filed Jul. 19, 1983, Ser. No. 515,128
Int. Cl.[4] G11B *5/86, 15/04*
U.S. Cl. 360—15 19 Claims

1. In a method for producing a first coded program on a first medium from a second coded program on a second medium by means of a programmable reading and writing device, the improvement comprising providing a second program on said second medium that is at least partially inoperable, controlling said programmable reading and writing device with a coded third program on a third medium to copy said second coded program onto said first medium at least in part in accordance with an algorithm contained in said third program, to thereby render said first program operable, and, during said step of controlling, modifying determined data in said third coded

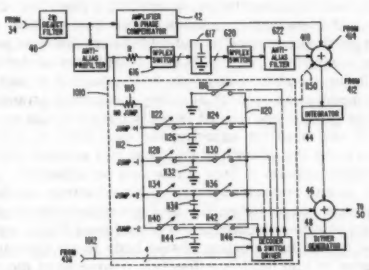


program on said third medium to record the number of occurences of said controlling step.

4,550,351
ADAPTIVE AUTOMATIC SCAN TRACKING SYSTEM

Kaarlo J. Hamalainen, Marlton, N.J., assignor to RCA Corporation, Princeton, N.J.

Continuation of Ser. No. 363,810, Mar. 31, 1982, abandoned.
This application Jan. 29, 1985, Ser. No. 695,754
Int. Cl.[4] G11B *5/58*
U.S. Cl. 360—77 4 Claims



1. A playback system comprising:

a headwheel;

playback transducing means associated with said headwheel and arranged for rotation coaxial therewith;

tape transport means adapted for passing a recorded tape around said headwheel along a path such that said playback transducing means recurrently scans a generally longitudinal path along said tape at an angle substantially equal to the angle of a recorded track, said playback transducing means scanning a path across said tape which may deviate from said recorded track, thereby causing mistracking;

a closed-loop automatic scan tracking means for varying the scanning path of said playback transducing means across said tape relative to the center of said recorded track, sensing means for sensing mistracking of said transducing means and means for generating an error signal for application to said closed-loop automatic scan tracking arrangement for moving the scanning path of said transducing means towards the center of a recorded track, said closed-loop automatic scan tracking means having relatively limited gain which permits residual tracking error along the length of said track;

a plurality of memory means coupled to said closed-loop

automatic scan tracking means for storing from scan to scan portions of said error signal from a like plurality of selected positions along said length of said track to form stored error signals; and

summing means coupled to said closed-loop automatic scan tracking means and to said plurality of memory means for adding said stored error signals to said error signal for supplementing said error signal with said stored error signal associated with said selected position for reducing said residual mistracking along the length of said track.

4,550,352

HEAD ADJUSTING DEVICE

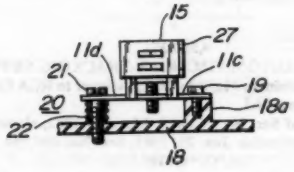
Toshihiro Nakao, Tokyo, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Oct. 26, 1982, Ser. No. 436,684

Claims priority, application Japan, Oct. 27, 1981, 56-159938[U]

Int. Cl.⁴ G11B *5/56, 21/24*

U.S. Cl. 360—109 **1 Claim**



1. A head adjusting device, comprising a plate-like resilient body, said body having a cross-shaped base portion and a folded portion connected to and folded over said base portion and in juxtaposition therewith, said folded portion defining a head fitting member, a magnetic head attached to said head fitting member, an azimuth adjusting mechanism arranged on said base portion and spaced laterally outwardly on opposed sides of said head for adjusting the inclination of said base portion to set the azimuth of said head said azimuth adjusting mechanism includes a fixed screw and an adjustable spring loaded screw, respectively, and a tilt adjusting mechanism arranged on said folded portion and spaced rearwardly of said head for adjusting the inclination of said head fitting member relative to said base portion of said body to set the angle of inclination of said head in a direction transverse of the direction of the azimuth adjustment.

4,550,353

THIN-FILM MAGNETIC HEAD AND METHOD FOR FABRICATING THE SAME

Osamu Hirai, Odawara; Tetsuo Kobayashi, Kanagawa; Shunichiro Kuwatsuka, Odawara, and Saburo Suzuki, Minamiashigara, all of Japan, assignors to Computer Basic Technology Research, Tokyo, Japan

Filed Dec. 7, 1983, Ser. No. 559,083

Claims priority, application Japan, Dec. 8, 1982, 57-213856

Int. Cl.⁴ G11B *5/14*

U.S. Cl. 360—125 **26 Claims**

1. A thin-film magnetic head having a magnetic core of double step structure comprising:

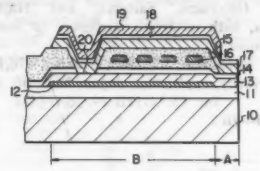
a substrate;

a first magnetic core formed on the substrate which has a predetermined thickness at a pole chip region thereof and a thickness larger than the predetermined thickness at a back region thereof;

a magnetic gap film formed on the first magnetic core;

a conductor coil formed over the magnetic gap film, which is encircled by an inter-layer insulating film; and

a first magnetic film formed on the inter-layer insulating film and connected with the first magnetic core at the back region; an insulating film formed on the first magnetic film; and a second magnetic film formed on the insulating



film, and removed at the pole chip region, said first and second magnetic films constituting a second magnetic core.

4,550,354

DISC CASSETTE (DISC CARTRIDGE)

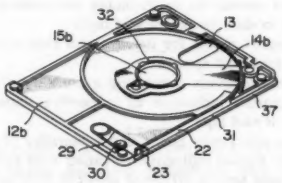
Manabu Wakabayashi; Kihachiro Minami, both of Yokohama; Tohru Sanpei, Kanagawa, and Kazutoshi Konno, Yokosuka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 18, 1982, Ser. No. 434,744

Claims priority, application Japan, Oct. 21, 1981, 56-167172

Int. Cl.⁴ G11B *23/02*

U.S. Cl. 360—133 **6 Claims**



1. A disc cassette (disc cartridge) formed, at each of opposite surfaces with a center opening for driving an information recording disc and a slot extending radially of the information recording disc to allow information recorded in the disc to be retrieved and including a housing of a substantially square shape for containing the information recording disc in enclosing relation, such disc cassette comprising:

(a) a pair of shutter means interposed between said disc for recording information and said housing and each of said shutter means including an annular portion located at one end portion and formed with a hole larger in size than the center openings, and a plate-like portion located at the other end portion and having an area greater than the area of the slots, said annular portion capable of rotating around said center openings to allow said shutter means to move between two stop positions, said plate-like portions being brought into index with said slot in the first stop position to close the same and brought out of index therewith in the second stop position to open the same;

(b) holding means formed on the disc cassette for holding the annular portion of the shutter means for rotation around the center openings;

(c) moving means coupled to the platelike portion of the shutter means for exerting a force on the plate-like portion to cause the annular portion of the shutter means to rotate around the center openings; and

(d) resilient means comprising a torsion spring coupled at one end to the moving means and at the other end to the disc cassette for exerting a biasing force on the moving means to cause the shutter means to move from the second stop position to the first stop position, and wherein a coiled portion of the torsion spring moves laterally rela-

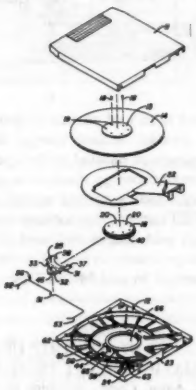
tive to the disc cartridge when the shutter means moves between the first stop position and the second stop position.

4,550,355

REMOVABLE DISK CARTRIDGE WITH IMPROVED HUB LOCKING MECHANISM

Bert R. Larson, San Jose, and Robert P. Wartenbergh, Woodside, both of Calif., assignors to Dysan Corporation, Santa Clara, Calif.

Filed Nov. 22, 1982, Ser. No. 443,771
Int. Cl.⁴ G11B *23/02*
U.S. Cl. 360—133 **4 Claims**



1. A disk cartridge assembly comprising; a housing having top and bottom portions with an inner surface for forming an enclosure, said bottom portion having a central aperture for receiving a disk hub and an offset aperture for permitting access to a hub locking mechanism, said inner surface of said bottom portion having an upstanding pivot edge located between said central and offset apertures;

a rigid disk assembly including a recording disk secured to an upper armature, a lower hub having an inner flange normally located within said enclosure and an outer flange normally located outside said enclosure, and means for securing together said disk, and armature, and said hub;

a releasable hub locking mechanism including a lever plate having an inner margin with a pair of hub flange pressure portions for surface contact with a lower surface of said inner hub flange, an outer margin having a lower release portion adapted to be engaged by a lock releasing element received in said offset aperture in said housing bottom portion surface, and an inwardly extending tang located adjacent said release portion; said inner margin having a lower surface with a portion thereof in surface contact with said pivot edge at a position between said tang and said inner margin to provide a pivot point about which the lever plate may rotate to cause the hub flange pressure portions to forcibly engage the lower surface of the inner hub flange; and

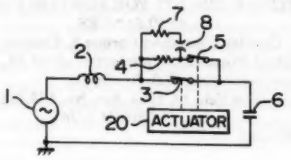
a longitudinally extending torsion spring located within said enclosure and having first and second ends secured against rotation by a pair of keeper bosses located on said inner surface of said bottom portion at positions flanking said hub flange pressure portions of said lever plate and a central portion in contact with said tang, said spring being normally in tosional compression for applying a downward spring force on said tang to cause said hub flange pressure portions to contact the lower surface of said inner hub flange which inturn biases said outer flange into engagement with the bottom portion of the housing.

4,550,356

CIRCUIT BREAKER

Isao Takahashi, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 7, 1983, Ser. No. 559,085
Claims priority, application Japan, Dec. 9, 1982, 57-214676
Int. Cl.⁴ H02H *7/22*
U.S. Cl. 361—9 **11 Claims**



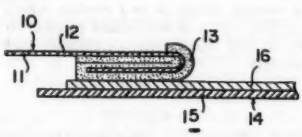
1. A circuit breaker comprising a breaking section including an openable/closable main breaking contact and a series circuit connected in parallel to said main contact and constituted by a breaking resistor means and an openable/closable resistor contact; an actuator means for performing closing/opening operations of said main breaking contact and said resistor contact; said breaking resistor means including a first resistor element and second resistor element having a resistance value which is smaller than that of said first resistor element; and a switching means for automatically changing the connection of said first and second resistor elements in accordance with a current breaking condition so that for small capacitive current breaking, a resultant equivalent resistance of said first and second resistor elements becomes a large value suitable for the small capacitive current breaking, while for short-circuit current breaking, said equivalent resistance becomes a small value mainly owing to the resistance value of said second resistor element.

4,550,357

INTERCONNECTED PRINTED CIRCUIT BOARDS AND METHOD OF CONNECTING CIRCUIT BOARDS

Hirofumi Matsumoto, Ibaraki, Japan, assignor to Nippon Mektron, Ltd., Japan

Filed Jun. 27, 1983, Ser. No. 508,281
Claims priority, application Japan, Jun. 30, 1982, 57-113009
Int. Cl.⁴ H05K *1/00;* H01B *11/02*
U.S. Cl. 361—398 **5 Claims**



1. A method of connecting printed circuit boards including the steps of:

applying electroconductive adhesive to ends of a first circuit pattern, said first circuit pattern being located on a first insulating base material, said first circuit pattern and said first base material defining a first printed circuit board;

aligning said ends of said first circuit pattern with corresponding ends of a second circuit pattern, said second circuit pattern being located on a second insulating base material, said second circuit pattern and said second base material defining a second printed circuit board;

said first and second base materials being different materials;

extending said ends of said first circuit pattern outwardly from said first base material;

forming at least one tooth shape in said first base material, said tooth shape corresponding to said outwardly extended ends of said first circuit pattern;

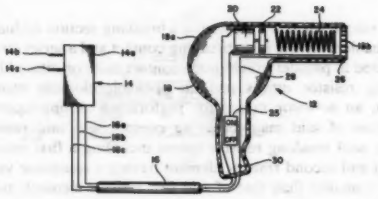
bending said at least one tooth shape downwardly to form a single overlapping structure; and

bringing said corresponding ends of said first and second circuit patterns together under pressure to form physical and electrical connections.

4,550,358
PROTECTIVE CIRCUIT FOR PORTABLE ELECTRIC APPLIANCES

George C. Crowley, Glenview; Gordon S. Carlson, Northbrook, and Michael Woznicki, Westchester, all of Ill., assignors to Sunbeam Corporation, Oak Brook, Ill.

Filed Feb. 13, 1984, Ser. No. 579,831
Int. Cl.[4] H02H *3/16*
U.S. Cl. 361—42 **21 Claims**



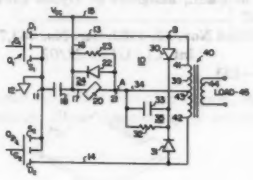
1. A portable appliance having a protective circuit comprising, a remote circuit module having a three wire cord interconnecting said module with an electric appliance, said appliance having an electrically insulating housing enclosing an open electrical element, a sensor member of electrically conducting material mounted in said housing in proximity to but spaced from said element, first and second input terminals on said module adapted for connection to a source of electrical power, first and second load terminals in said module each connected by an insulated conductor to supply power to said element in said appliance, an insulated conductor extending from a sensor terminal in said module into connection with said sensor member in said appliance, means in said module connected to said sensor terminal to establish a voltage on said sensor member at a level less than the voltage across said load terminals when said input terminals are connected to a source of power, overload fuses in said module connected between said first input and load terminals and between said second input and load terminals, sensing means in said module which responds to changes in the voltage of said sensor member to short circuit the power to said input terminals through each one of said fuses separately.

4,550,359
VOLTAGE TRANSIENT PROTECTION CIRCUIT FOR MOSFET POWER TRANSISTORS

Gerald W. West, Seattle, Wash., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 10, 1984, Ser. No. 578,922
Int. Cl.[4] H02H *9/04*
U.S. Cl. 361—56 **5 Claims**

1. A voltage transient protection circuit for a pair of metal oxide semiconductor field effect transistors (MOSFETs) operated in a push-pull circuit with said MOSFETs each having a drain connection, a source connection, and a gate connection, including: a transformer having a tapped primary winding and a pair or primary end windings; a first of said pair of end windings connected to a first of said drain connections, and a second of said pair of end windings connected to a second of said drain connections; a pair of diodes with each of said diodes connected to a separate transformer end winding with said diodes further connected in common to a first end of an energy dissipation means; said energy dissipation means having a second end connected to said transformer tapped winding; said energy dissipation means including a parallel combination of a capacitor and a resistor; said transformer tapped winding further connected by circuit means to a source of potential for

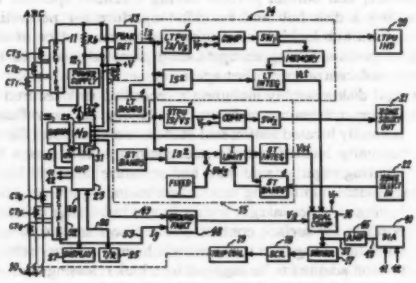


said MOSFETs and with said source of potential further including a circuit ground; second energy dissipation means having inductive means in parallel with a parallel connected diode means; said second energy dissipation means connecting said tapped primary winding to said source of potential; and both of said MOSFETs source connections being connected to said circuit ground; said diodes and said energy dissipation means limiting voltage transients in said protection circuit to a level that is not harmful to said MOSFETs.

4,550,360
CIRCUIT BREAKER STATIC TRIP UNIT HAVING AUTOMATIC CIRCUIT TRIMMING

John J. Dougherty, Avon, Conn., assignor to General Electric Company, New York, N.Y.

Filed May 21, 1984, Ser. No. 612,508
Int. Cl.[4] H02H *3/16*
U.S. Cl. 361—93 **21 Claims**



1. A static trip circuit interrupter comprising:

separable contacts within a protected power distribution circuit;

sensing means within said system for determining magnitudes of current through said contacts;

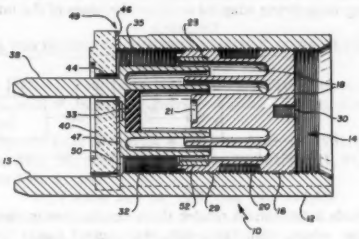
interrupter means within said system for opening said contacts upon predetermined conditions of said current magnitudes and of time;

trip unit means, including electrically active and passive circuit components, for determining the occurrence of said predetermined conditions of current and time and for actuating said interruption means to open said contacts, said trip unit means further including electrically alterable memory means and a digital processor for providing calibration and correction facility to selected ones of said active and passive components.

4,550,361
ADJUSTABLE MULTITURN AIR DIELECTRIC CAPACITOR

Frank Swinehart, Waseca, Minn., assignor to E. F. Johnson Company, Waseca, Minn.

Filed Jun. 11, 1984, Ser. No. 619,061
Int. Cl.[4] H01G *5/22*
U.S. Cl. 361—295 **15 Claims**

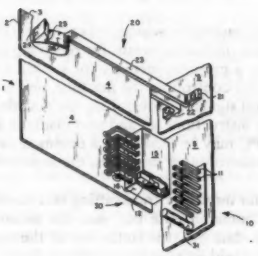


1. An adjustable air dielectric capacitor for an electrical circuit comprising:
- a hollow cylindrical internally threaded housing having means connectable to an electrical circuit;
- a ceramic insulating disc secured over one end of the housing;
- a cylindrical stator in the form of a plurality of concentrically positioned tubular plates connected at one end, the stator being concentrically fixed inside the housing and secured to the insulaitng disc, the stator having means connectable to an electrical circuit;
- a cylindrical rotor in the form of a plurality of concentrically positioned tubular plates connected at one end, including an outer plate having an interior surface and being in the form of a plurality of ribs, the rotor being concentrically positioned inside the housing in operative relation to the stator, and in threaded engagement with the housing;
- spring means in operative engagement with the interior surface of the outer rotor plate to bias the ribs, in a cantilever fashion, toward the housing whereby electrical contact between the rotor and the housing is assured and torque is created between the outer rotor plate and the housing to prevent unwanted rotor motion within the housing.

4,550,362
BOARD POSITIONING ARRANGEMENT

William A. Reimer, Wheaton, Ill., assignor to GTE Automatic Electric Inc., Northlake, Ill.

Filed Nov. 22, 1982, Ser. No. 443,772
Int. Cl.[4] H05K *7/14*
U.S. Cl. 361—415 **4 Claims**

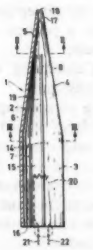


1. A vertical planar assembly positioning arrangement including an upper edge and a front edge, said arrangement comprising:
- a vertically oriented rigid backplane;
- a retainer of unitary construction including
  - a rigid base portion mounted to said backplane proximate to said planar assembly upper edge,
  - a rigid guide portion connected to said rigid base portion and extending in a direction perpendicularly from said backplane and engaging said planar assembly upper edge,
  - a latch portion including a vertical groove in a side thereof facing and adapted to engage said front edge of said planar assembly, and
  - a flexible section connecting said latch portion to said guide portion, said flexible section yielding to facilitate displacement of said latch portion to thus permit engagement of said planar assembly first edge within said guide portion, and in response to passage of said planar assembly past said latch portion, said flexible section automatically restoring to engage said vertical groove with said planar assembly front edge; and
- support means comprising
  - a plurality of connector pins attached to and extending perpendicularly from said backplane, and
  - a connector body including a corresponding plurality of connector receptacles engaging said pins and attached to said planar assembly to support said planar assembly and provide paths for electrical signals to and from said planar assembly.

4,550,363
CANDLE SIMULATING LIGHT BULB COVER

Sven Sandell, Kälkbacksgatan 5, S-552 62 Jönköping, Sweden

Filed Sep. 19, 1984, Ser. No. 652,031
Claims priority, application Sweden, Sep. 21, 1983, 8305082
Int. Cl.[4] F21V *11/00*
U.S. Cl. 362—806 **8 Claims**

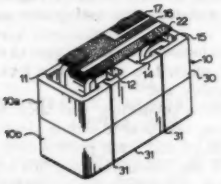


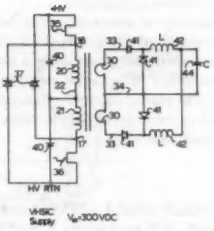
1. An electric lamp arrangement for simulating a burning candle flame, comprising: an electric light bulb (15) having a generally cylindrical portion, an elongated lamp casing (1) surrounding the bulb, having a shape which corresponds substantially to the outer shape of a candle flame, and made of a light-permeable and light-scattering material, an elongate cavity (19) extending axially through the casing and defining an open lower end (16) for introducing the light bulb into the cavity, a plurality of circumferentially distributed spacing elements (6-13; 23,24) projecting radially inwardly from an inner wall (5) of the casing and abutting an outer surface (14) of the cylindrical portion of the bulb, and an upwardly directed aperture (18) in an upper end (17) of the casing remote from the bulb, said aperture having a diameter less than that of the bulb and substantially less than the open lower end, said spacing elements defining vertical passages for continuous convection air flow upwardly between the bulb and the casing from the open lower end of the cavity to and out through the aperture to dissipate heat generated by the bulb and to thereby cool both the bulb and the casing.

4,550,364
POWER TRANSFORMER FOR USE WITH VERY HIGH SPEED INTEGRATED CIRCUITS

William S. Shaw, P.O. Box 180579, Austin, Tex. 78718

Filed Jun. 5, 1984, Ser. No. 617,386
Int. Cl.[4] H01F *27/24*
U.S. Cl. 363—24 19 Claims





1. A transformer for frequencies greater than 50 KHZ which comprises:

a parallelipiped shaped core of ferrite material of high resistivity having two parallelepiped shaped side-by-side channels therethrough, a portion of said core extending between said channels;

a primary winding extending through said channels and around said portions; and

a secondary winding comprising an electrically conductive coating on the surfaces of said core including the surfaces thereof defining said channels and the surfaces of said portion, said coating having a first slit around the openings for said channels on one end of said core and a second slit which extends normally from a first connection to said first slit proximate said portion to the other end of said core where it extends across said portion and returns to a second connection with said first slit at a location proximate said portion and opposite said first connection, and electrical leads to said secondary winding being in contact with said conductive coating on opposite sides of said second slit on said core.

4,550,365
STATIC SEMI-CONDUCTOR ELECTRICAL ENERGY CONVERTER APPARATUS

Henri Foch, and Jacques Roux, both of Toulouse, France, assignors to Agence Nationale pour la Valorisation et la Recherche, Paris, France

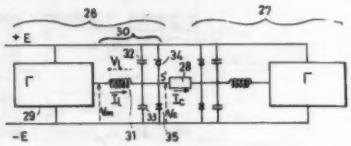
Filed Aug. 15, 1983, Ser. No. 523,192
Claims priority, application France, Aug. 13, 1982, 82 14192
Int. Cl.[4] H02P *13/18*
U.S. Cl. 363—98 9 Claims

1. Static semi-conductor electrical energy converter Γ apparatus comprising:

(a) a power stage including a pair of controlled blocking static interrupters, each having a collector, base and emitter electrodes, and a commutation assistant circuit associated with each of the interrupters for speeding up commutation of the interrupters;

(b) a control stage for developing a control signal S_C;

(c) a signal processing stage associated with each interrupter having two inputs, the signal S_C being applied to one input, and the collector-emitter voltage C_{CE} of the interrupter being applied to the other input, the output of the signal processing stage being connected to the power stage to trigger commutation thereof, the signal processing stage being adapted to drive the bases of the interrupters in a fashion to render them conductive in the single case where, simultaneously, the control signal S_C has a value corresponding to an initiation of conduction of the interrupter, and the voltage V_{CE} of the interrupter is approaching zero; and

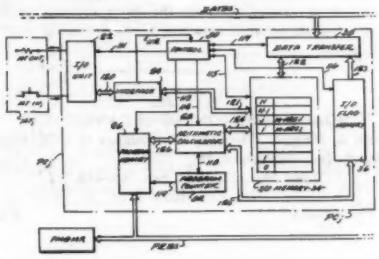


(d) a supplementary output stage for generating an alternating current at the output of the power stage which changes direction at each commutation thereof, the direction of the alternating current changing according to the direction of circulation of current in the emitter-collector of each interrupter at the instant of commutation.

4,550,366
PROGRAMMABLE SEQUENCE CONTROLLER AND SYSTEM

Fumiyasu Toyama; Masaaki Murakoshi; Masanori Wakuda; Junichi Sasaki; Hirotoshi Watanabe; Tomio Yukawa, and Yoshihiko Okayama, all of Shizuoka, Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 12, 1982, Ser. No. 407,542
Claims priority, application Japan, Oct. 17, 1981, 56-164941
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—136 8 Claims



1. In a programmable sequence controller (PC) for controlling a machine, including means for receiving status data from said machine, a program memory for storing a set of program instructions for controlling the machine, and means for generating a control signal for controlling the machine responsive to the program instructions set and said machine status data, and where said PC may be linked via a common data bus to other PCs which control other machines, the improvement comprising:

data transfer means for transmitting said machine status data to said common data bus, and for receiving from said common data bus, the status bus of the machines associated with said PCs; and

input/output (I/O) status memory means for storing said machine status data and said other status data, thereby

providing said PC with the ability to generate a control signal that can be responsive to said other data , said I/O status memory means including an I/O memory for storing said machine and said other status data, and a flag memory for marking an address of said I/O memory to indicate the presence or absence of a communication occurring between any of said PCs and its associated machines.

4,550,367

DATA PROCESSING SYSTEM HAVING HIERARCHICAL MEMORIES

Akira Hattori, Yokohama, and Takamitsu Tsuchimoto, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

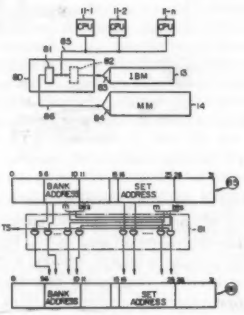
PCT No. PCT/JP80/00169, § 371 Date Mar. 25, 1981, § 102(e) Date Mar. 20, 1981, PCT Pub. No. WO81/00321, PCT Pub. Date Feb. 5, 1981

PCT Filed Jul. 24, 1980, Ser. No. 245,646

Claims priority, application Japan, Jul. 25, 1979, 54-94512

Int. Cl.[4] G06F *9/00, 7/00*

U.S. Cl. 364—200 **8 Claims**



1. A data processing system having hierarchial memories, comprising:

a plurality of central processing units each having buffer memories;

an intermediate buffer memory, operatively connected to said central processing units for storing data in sets of the data blocks; including at least two data set storage areas each containing at least two data block storage areas;

a main memory operatively connected to said intermediate buffer memory divided into a plurality of banks and the banks being divided into data blocks which are the units accessed by said central processing units, including first and second data bank storage areas each having a data block storage area, when a needed data block is in the first data bank storage area an unneeeded data block in one of said intermediate buffer block memory data block storage areas is moved into the first data bank storage area and the needed data block is moved form the first data bank bank storage area into the one of said intermediate buffer memory data block storage areas replacing the unneeded data block by addressing said main memory with bank selection data in which a part of the set address portion is substituted for a part of the bank selection data, the needed and unneeded data blocks each belonging to the same data bank storage areas, so that the data blocks are moved into and out of the same data bank storage area;

move-out and move-in operations for a needed data block, between said intermediate buffer memory and said main memory, being achieved under a swap control metod, and said main memory and intermediate buffer memory are both controlled under a set associative method;

said main memory being accessed under an interleave control method; and

said main memory and said intermediate buffer memory being accessed by address information which includes both bank-selection address bits, for specifying any one of said and set-selection address bits for specifying said data block to be moved-out and moved-in, and the bank-selection address bits being partially modified by a part of the set-selection address in such a manner as to access said memory in a 2^m-pathway interleave control mode, the symbol m being an integer representing the number of bits of said bank-selection address bits substituted for by said set-selection address bits, the number m as being defined by the expression

$$B/2^m = M,$$

where the symbol B is an integer which indicates the number of said banks in said main memory and the symbol M is a positive integer indicating the number of banks that can be integer divisible by 2^m-pathways.

4,550,368

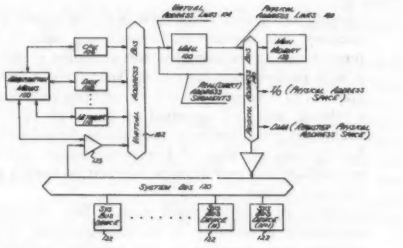
HIGH-SPEED MEMORY AND MEMORY MANAGEMENT SYSTEM

Andreas Bechtolsheim, Stanford, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Continuation-in-part of Ser. No. 394,555, Jul. 2, 1982, Pat. No. 4,527,232. This Application filed Oct. 31, 1983, Ser. No. 547,397

Int. Cl.[4] G06F *9/34, 13/00*

U.S. Cl. 364—200 **12 Claims**



1. A computer system employing address translation, comprising:

a plurality of data processing devices selectively coupled to a virtual address bus for carrying memory addresses, said address bus including means for separating a memory address into direct and indirect address segments;

arbitration means coupled to said data processing devices for selectively coupling said data processing devices to said virtual bus such that only one of said data processing devices applies a memory address to said virtual bus at a time;

memory management means connected to receive said indirect segments of said memory address along indirect address segment input lines for translating an indirect address segment from a logic address specified by a data processing device to a physical address, said memory management means being a relatively high speed storage array having an output along physical address lines;

a physical address bus coupled to said memory management means, said physical address bus being coupled to at least one data processing resource having a plurality of physical addresses, each of said physical addresses being defined by said direct address segment in conjunction with said translated indirect address provided on said physical address lines;

whereby a data processing device may access said data processing resource at high speed by passing a direct address segment directly to said resource and a translated

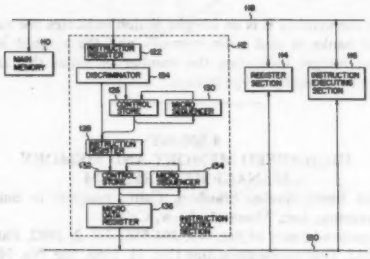
indirect address segment to said resource thereby defining a physical address location.

4,550,369

APPARATUS AND METHOD FOR PROCESSING MACROINSTRUCTIONS AND MICROINSTRUCTIONS

Takashi Rokutanda, Tokyo, and Hiroshi Nakamura, Tokorozawa, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 18, 1983, Ser. No. 495,614
Claims priority, application Japan, May 21, 1982, 57-85752
Int. Cl.⁴ G06F *9/00, 13/00*
U.S. Cl. 364—200 **5 Claims**



5. A method of processing digital signals comprising the steps of:

(1) storing instructions in the form of digital signals in a main memory, said digital signals specifying tasks to be performed, said stored digital signals including at least one of a high performance instruction specifying a task and a plurality of low performance instructions each specifying a subtask, said task specified by said high performance instruction performable by performing the subtasks specified by said plurality of low performance instructions, each of said low performance instructions having a predetermined format;

(2) storing, in a first control store, a first microprogram comprising a plurality of microinstructions specifying subtasks corresponding to said subtasks specified by a plurality of low performance instructions, said microinstructions of said first microprogram having said predetermined format;

(3) storing, in a second control store, a second microprogram including a plurality of microinstructions each specifying a microtask, each of said subtasks performable by performing at least one of said microtasks;

(4) reading an instruction stored in said main memory;

(5) determining whether the instruction read by said reading step (4) is said high performance instruction;

(6) if said determining step (5) determines the instruction read by said reading step (4) is said high performance instruction, performing the following steps:

(a) reading at least part of said first microprogram from said first control store;

(b) reading the microinstructions from said second control store specifying the microtasks which, when performed, perform the subtasks specified by said first microprogram read by said reading step (6a); and

(c) performing said microtasks specified by the microinstructions read by said reading step (6b); and

(7) if said determining step (5) determines that the instruction read by said reading step (4) is a low performance instruction, performing the steps of:

(a) reading, from said second control store, the microinstructions specifying microtasks which, when performed, perform said subtasks specified by said instruction read by said reading step (4); and

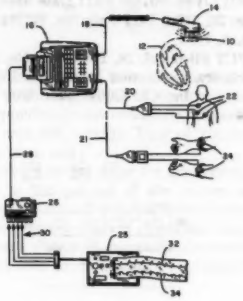
(b) performing said microtasks specified by the microinstructions read by said reading step (7a).

4,550,370

PACEMAKER PROGRAMMER WITH TELEMETRIC FUNCTIONS

Richard W. Baker, Anoka, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 437,665, Oct. 29, 1982, abandoned.
This application Feb. 13, 1985, Ser. No. 701,055
Int. Cl.⁴ G06F *15/42*
U.S. Cl. 364—413 **1 Claim**



1. A method of operating a programmer for use in telemetric programming of implantable cardiac pulse generators which produce pulse-interval-modulated output signals consisting of bursts of radio frequency energy wherein a first relatively long time interval between two bursts represents a digital logic signal of a first value and a relatively short time interval between two bursts represents a digital logic signal of a second value, said first and second time intervals being variable from pulse generator to pulse generator such that the relatively short time interval associated with one pulse generator may exceed the relatively long time interval associated with another pulse generator, wherein said pulse generator telemetrically transmits a calibration signal train comprising a predetermined number of bursts having a pattern of relatively short and relatively long time intervals therebetween to said programmer, comprising:

(a) measuring each of said short and long time intervals between said bursts of said signal train in succession;

(b) establishing a control interval associated with each time interval measurement which allows for the measurement of the next time interval after the previous time interval measurement has been stored;

(c) storing each of said measurements during the associated control interval;

(d) validating said signal train only if all of said measured time intervals are greater than a predetermined minimum time interval and are less than a predetermined maximum time interval;

(e) determining from said measurements short and long time window intervals for the pulse generator being programmed;

(f) verifying that said signal train is valid only if said short time window interval and said long time window interval are separated by a predetermined minimum time interval value; and,

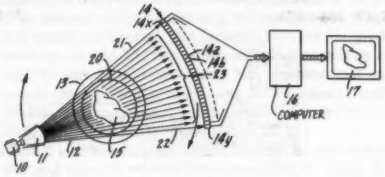
(g) decoding telemetric messages thereafter transmitted from said pulse generator after said signal train is both validated and verified.

4,550,371

METHOD AND APPARATUS FOR COMPENSATING CT IMAGES FOR TRUNCATED PROJECTIONS

Gary H. Glover, Waukesha, and Norbert J. Pelc, Milwaukee, both of Wis., assignors to General Electric Company, Waukesha, Wis.

Filed Sep. 27, 1982, Ser. No. 424,501
Int. Cl.[4] A61B 6/00
U.S. Cl. 364—414 9 Claims



1. A method of compensating a CT image comprising the steps of exposing a body to radiation at a plurality of angles about the body, detecting radiation passing through the body at the plurality of angles to create a set of projections, each of the projections including reference channel information indicative of the unobstructed X-ray source density for normalizing the associated projection but in which some of said projections are effected by the body extending beyond the field of view to obstruct the reference channels; analyzing the reference channel information to detect reference channel information below a predetermined level and thereby identify the projections having reference channel information affected by the object, determining a typical reference channel level representative of the projections having reference channel information unaffected by the object from the unaffected projections, assigning the typical reference channel level to the reference channels of said identified projections, normalizing each projection with the reference level assigned thereto, and producing an image from the normalized projection set.

5. A method of compensating a CT image comprising the steps of exposing a body to radiation at a plurality of angles about the body, detecting radiation passing through the body at the plurality of angles to create a set of projections, some of said projections being truncated by the body extending beyond the field of view, determining a plurality of moments of the projection set, determining from the moments the amount of mass missing from each truncated projection and the distribution of the missing mass in each truncated projection, fitting a low order polynomial conforming with the moments and boundary conditions to extend each truncated projection, convolving each projection with a kernel to produce a convolved projection set and producing an image from the convolved projection set.

4,550,372

CONTROL SYSTEM FOR A VEHICULAR BRAKING SYSTEM INCORPORATING A HYDRODYNAMIC BRAKE AND A FRICTION BRAKE

Manfred Kahrs, Wiesbaden, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 273,832, Jun. 15, 1981, abandoned. This application Sep. 6, 1983, Ser. No. 529,315
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1980, 3027747
Int. Cl.[4] B60T 8/04, 13/66; F16D 65/36
U.S. Cl. 364—426 5 Claims

1. A control system for a vehicular braking system incorporating a hydrodynamic brake and a friction brake comprising:

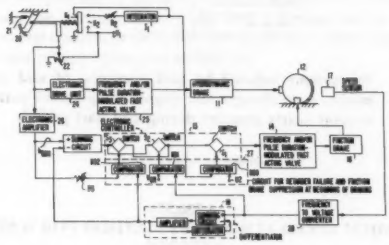
first means coupled to a brake pedal to produce a control signal corresponding to a desired total braking torque;

an open loop coupled to said hydrodynamic brake and said first means to control said hydrodynamic brake in response to said control signal to provide at least a portion of said total braking torque, said open loop including a first valve coupled to said hydrodynamic brake controllable by said control signal;

second means associated with a selected one of at least on vehicle wheel and a vehicle to produce a feedback signal proportional to an instantaneous deceleration of said vehicle; and

a closed loop coupled to said first means and including said friction brake and said second means to control said friction brake in response to said control signal and said feedback signal, said closed loop including

a brake operation sensing comparator to operate a first switch to permit operation of said friction brake after a predetermined duration of operation of the brake pedal taking place,



a speed sensing comparator connected to operate a second switch to permit operation of said friction brake if the actual vehicle speed is greater than a predetermined threshold speed

a deceleration sensing comparator to operate a third switch to interrupt operation of said friction brake if the actual vehicle wheel deceleration is greater than a predetermined wheel deceleration said closed loop including a second valve coupled to said friction brake controllable by the difference between said control signal and said feedback signal, and to enable said friction brake to produce a braking torque equal to the difference between said desired total braking torque and said portion of said total braking torque.

4,550,373

TEMPERATURE-FEEDBACK ELECTRONIC ENGINE CONTROL APPARATUS AND METHOD

Toshimitsu Ito, Toyota; Toshiaki Isobe, Nagoya, and Takashi Hattori, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 29, 1982, Ser. No. 403,043
Claims priority, application Japan, Feb. 19, 1982, 57-24347
Int. Cl.[4] F02D 5/02, 33/00; F02M 51/00; F02N 11/14
U.S. Cl. 364—431.04 6 Claims

1. An electronic control system for an internal combustion engine comprising:

means for detecting a start period for said engine defined by operation of a starting motor adapted to start said engine;

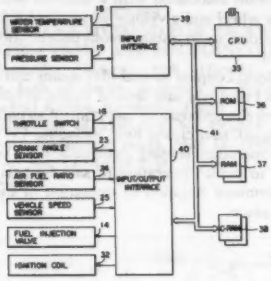
means for detecting a complete explosion operation of said engine defined by the occurrence of self-sustained combustion in said engine without operation of said starting motor;

sampling means for sampling at least two engine operating parameters, including at least the engine temperature, at a determined sampling rate and in a specified sequence;

control means for controlling at least the air-fuel ratio of said engine in response to said sampled parameters; and

means, responsive to said start period and complete explosion detecting means, for establishing said determined sampling rate at a higher frequency during said start period than during said complete explosion operation so as to

more closely monitor said engine temperature parameter during said start period because of increased sampling

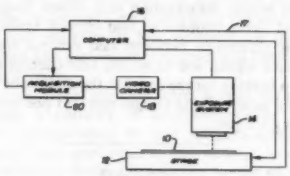


fluctuations induced by said operation of said starting motor, even though said engine temperature parameter remains nearly constant during said start period.

4,550,374
HIGH SPEED ALIGNMENT METHOD FOR WAFER STEPPER

Boris Meshman; Thomas A. Kerekes; Lawrence S. Green, and David Karlinsky, all of Canoga Park, Calif., assignors to TRE Semiconductor Equipment Corporation, Woodland Hills, Calif.

Filed Nov. 15, 1982, Ser. No. 441,413
Int. Cl.[4] G06F *15/46;* H05K *13/00;* H04N *7/18*
U.S. Cl. 364—490 **8 Claims**



1. In an exposure system in which a plurality of overlapping patterns are exposed onto a semiconductor wafer in a step-and-repeat fashion, wherein each pattern formed during an initial step-and-repeat operation includes an associated alignment target and subsequent patterns are aligned with the initial patterns by viewing the alignment targets, a method for increasing the throughput of the system comprising the steps of:

stepping the wafer toward a predetermined target position while monitoring the position of the wafer;

viewing an area on the wafer which includes the target, wherein the viewing is intiated after the wafer has arrived at the target position but prior to the wafer coming to acomplete stop at the target position; moving the wafer toward an expected exposure position immediately upon completion of the viewing of the wafer;

calculating, as a function of the position of the target when the wafer is at the target position, the offset of the initially exposed pattern with respect to its desired position, wherein said calculating is done while the wafer is being moved;

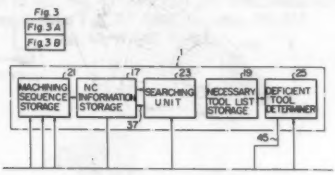
moving the wafer toward a corrected exposure position in response to the offset calculation; and

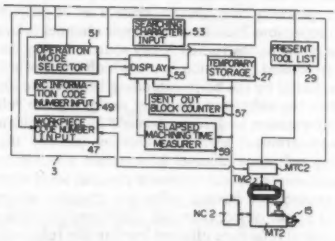
exposing a subsequent pattern onto the wafer after it has arrived at the corrected exposure position.

4,550,375
MACHINING SYSTEM WITH OPERATING MODE SELECTORS PROVIDED IN MACHINE CONTROLLER OF EACH NC MACHINE TOOL

Makoto Sato, Kanagawa, and Kazuyuki Hiramoto, Sagamihara, both of Japan, assignors to Makino Milling Machine Co., Ltd., Tokyo, Japan

Filed Feb. 7, 1983, Ser. No. 464,375
Claims priority, application Japan, Feb. 13, 1982, 57-20696
Int. Cl.[4] G06F *15/46;* G05B *19/29*
U.S. Cl. 364—474 **20 Claims**





1. A machining system for machining of workpieces by employment of a plurality of NC machine tools, each of said NC machine tools being located at a machining site and being provided with and associated with an NC unit for calculating a tool path based on NC machining information and controlling movement of the associated machine tool, comprising:

a single master controller for originally storing NC programs including means for storing the NC machining information for all said NC machine tools and commanding operation of each of said NC machine tools by sending said NC machining information to said NC machine tools;

a workpiece-code-number reading means for reading and outputting code numbers of said workpieces to be machined by said plurality of NC machine tools; and

a machine controller for each said NC machine tools and associated therewith positioned between said master controller and each of said NC machine tools for receiving said NC machining information from said master controller and sending out in a form suited for being inputted to each said NC machine tool;

each said NC unit associated with each said machine tool solely receives said NC machining information one by one from said machine controller associated with said NC unit and said machine tool, from the NC machinery information temporarily stored in said associated machine controller;

said master controller including:

at least an NC machining information storage unit for storing correspondence between said code numbers of said workpieces and code numbers of said NC machining information for machining said workpieces, and a number of kinds of NC machining information used for controlling the NC machining implemented by said plurality of NC machine tools, and

a machining sequence storage means into which the code numbers of said NC machining information are inputted in

advance and in which the machining sequences of each said NC machine tool are registered;

said machine controller provided between said master controller and each of said NC machine tools including at least:

temporary storage means capable of temporarily storing a plurality of units of said NC machining information sent from said master controller, each said unit containing therein a predetermined amount of NC machining information, so that said temporary storage means receives a large amount of NC machining information at a time from said master controller, and including means for gradually sending out said NC machining information one by one to the NC unit of said associated NC machine tool and for synchronizing the NC machining information to and with the NC machine tools at a rate capable of being inputted to each said NC machine tool; and

operation mode selecting means located at said machining site and capable of selecting an operation mode from a plurality of operation modes, including:

a first operation mode in which said NC machining information from said master controller is interrupted and each said NC machine tool is operated independently from said master controller by an associated NC unit of each said NC machine tool,

a second operation mode in which the code number of said NC machining information corresponding to the workpiece code number of each said NC machine tool read out by said workpiece code number reading means is searched and taken out of said storage means of said master controller by said machining sequence storage means and the NC machining information of the searched code number is sent from said master controller, and

a third operation mode in which said NC machining information is sent out from said master controller in the machining sequences registered in said machining sequence storage means; and

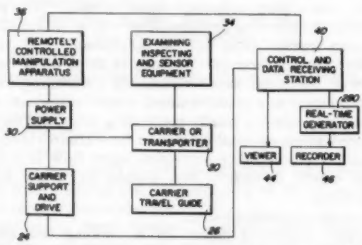
display means for indicating said workpiece code number read out by said workpiece code number reading means, said code number of the NC machining information registered by said machining sequence storage means, and the contents of the NC machining information sent from said master controller.

4,550,376

INSPECTION SYSTEM FOR MECHANICAL STRUCTURES

Robert A. Maciejczak, 7640 W. Devon, Chicago, Ill. 60631

Filed Feb. 14, 1983, Ser. No. 466,147
Int. Cl.[4] H04N *7/18*
U.S. Cl. 364—512 **40 Claims**



1. Apparatus for perusal and for rigorous inspection of architectural and of mechanical structures at a remote site and for examination of structures and architecture to determine state of repair, construction parameters, quality of restorative and corrective work required and in process, to establish building and repair specifications and standards, and to determine compliance therewith,

said apparatus comprising

controllably movable carrier means for support of scanning, testing and sensor equipment thereon,

selectively positionable, elongated guide means for supporting said carrier means and for delineating an inspection path to be traversed by said carrier means,

drive means for controlling movement of said carrier means along a selectable predetermined inspection path correlated with a course of travel defined by said guide means,

electrical means for transmitting intelligence received by scanning, testing and sensor equipment supported on said carrier means,

receptor means remote from scanning, testing and sensor equipment on said carrier means for receiving intelligence transmitted by said electrical means,

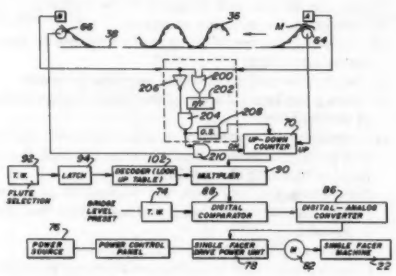
said receptor means including transducer means for converting the intelligence received from scanning, testing and sensor equipment on said carrier means into a form susceptible of perception and evaluation.

4,550,377

PROXIMITY FLUTE DETECTION

Robert H. Craemer, Cherry Hill, N.J., assignor to Molins Machine Company, Inc., Cherry Hill, N.J.

Filed Oct. 24, 1983, Ser. No. 544,922
Int. Cl.[4] G06F *15/46*; **G05D** *5/00*
U.S. Cl. 364—471 **16 Claims**



1. A method of regulating the length of fluted web stored in a bridge, comprising:

optically detecting the passage of discrete web flutes at the inlet and outlet of the bridge,

maintaining a count of the number of flutes detected at said bridge inlet and said bridge outlet;

computing the difference between the counts,

selectively generating a signal having a value proportional to the number of flutes per unit length of the web,

converting the difference count to a signal representative the actual length of web stored in the bridge by multiplying the difference count by said value,

generating a set point signal representative of desired length of fluted web to be stored on the bridge,

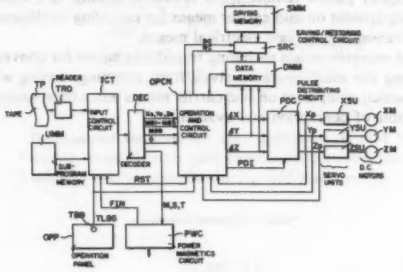
comparing the signal representative of actual length of web stored on the bridge to said set point signal and generating an error signal based on the comparison, and

varying the speed of the web in response to said error signal.

4,550,378
METHOD OF NUMERICAL CONTROL AND DEVICE THEREFOR

Ryoichiro Nozawa, Tokyo; Tsuyoshi Nagamine, Hachioji, and Atsushi Shima, Tokyo, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

Continuation of Ser. No. 620,545, Jun. 18, 1984, abandoned, which is a continuation of Ser. No. 288,185, Jul. 29, 1981, abandoned. This application Feb. 8, 1985, Ser. No. 700,052
Claims priority, application Japan, Aug. 1, 1980, 55-106025
Int. Cl.⁴ G06F *15/46*; G05B *23/02*
U.S. Cl. 364—474 **10 Claims**



1. A method for controlling a machine tool operatively connected to a numerical control device and having an internal state, a memory for storing a machine program and a subprogram associated with a specific abnormality of the machine tool, the memory being operatively connected to receive a specified signal corresponding to said specific abnormality, said method comprising the steps of:

(a) storing the subprogram associated with the specific abnormality in the memory;

(b) storing the machine program in the memory;

(c) executing the machine program;

(d) receiving the specified signal in response to the abnormality occurring;

(e) halting the execution of the machine program;

(f) storing the internal state of the numerical control device in the memory;

(g) executing the subprogram associated with the specific abnormality to automatically change the tool, the subprogram comprising the steps of:

(1) moving the tool from the workpiece in accordance with the machining being performed to a tool changing position;

(2) changing the tool;

(3) moving the tool from the tool changing position to the workpiece;

(h) replacing the internal state of the numerical control device with the internal state stored in the memory; and

(i) resuming execution of the machine program.

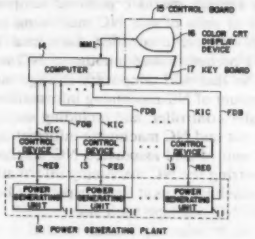
4,550,379
METHOD OF ELECTRIC POWER PLANT OPERATION

Kensuke Kawai, Higashimurayama, and Shuntaro Tanaka, Musashino, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 15, 1983, Ser. No. 504,401
Claims priority, application Japan, Jun. 18, 1982, 57-103941
Int. Cl.⁴ G06F *15/56*
U.S. Cl. 364—494 **15 Claims**

1. A machine-implemented method of operating a thermal power generating plant having at least one power generating unit comprising the steps of:

(A) determining, in accordance with a given time point t_1 at which the power generating unit is to become capable of load control and assumed time length T_1 for time length of initial load holding TINT, a predicted value t'_{PI} of a time point t_{PI} of parallel-in, a predicted value t'_{GT} of a time point t_{GT} of a gas turbine start; and a predicted value t'_{INC} of a time point t_{INC} of initial load hold completion; and

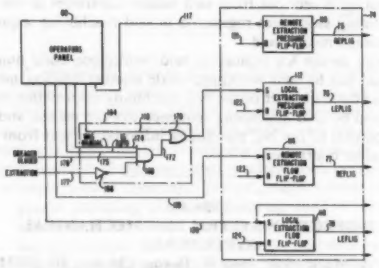


(B) correcting the predicted values t'_{PI}, t'_{GT} and t'_{INC} by adding $k(t_1 - t'_{INC})$ to t'_{PI}, t'_{GT} and t'_{INC}, respectively, k being a given value satisfying $0 < k \leqq 1$.

4,550,380
MICROPROCESSOR-BASED EXTRACTION TURBINE CONTROL

James M. Bukowski; Gary E. Midock, both of Pittsburgh, and Ronald J. Walko, Bethel, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 16, 1983, Ser. No. 562,507
Int. Cl.⁴ G06F *15/46*; H02P *9/04*
U.S. Cl. 364—494 **14 Claims**



1. A control apparatus for operating an extraction steam turbine-electric power generation system so as to allow a bumpless transfer into an extraction mode of operation for locally controlling extraction steam pressure in a predetermined local extraction pressure control loop, or for allowing a bumpless transfer from said predetermined local extraction pressure control loop into any one of three other extraction modes of operation, one for remotely controlling extraction steam pressure in a predetermined remote extraction pressure control loop, one for locally controlling extraction steam flow in a predetermined local extraction flow control loop, or one for remotely controlling extraction steam flow in a predetermined remote extraction flow control loop, said apparatus comprising:

a turbine extraction valve;

a valve controller means for positioning said extraction valve;

a pressure transmitter means for providing a pressure feedback signal corresponding to the existing level of said extraction steam pressure in said system;

a flow transmitter means for providing a flow feedback signal corresponding to the existing level of said extraction steam flow in said system;

an extraction control loop selection controller means for

determining one of four transitional operating states, a first transitional operating state corresponding to entry into said predetermined local extraction pressure control loop, a second transitional operating state corresponding to entry into said predetermined remote extraction pressure control loop, a third transitional operating state corresponding to entry into said predetermined local extraction flow control loop, or a fourth transitional operating state corresponding to entry into said predetermined remote extraction flow control loop;

an operator panel means for determining the operation of said extraction control loop selection controller means in accordance with an operator selection at said operator panel means;

an extraction transition reference controller means for determining an extraction transition reference signal equal to said pressure feedback signal in said first or second transitional operating states or equal to said flow feedback signal in said third or fourth transitional operating states;

an extraction valve pressure transition setpoint controller means operative with said extraction transition reference controller means for determining an extraction valve pressure setpoint signal in said first or second transitional operating states in accordance with a predetermined function of said extraction transition reference signal, said pressure feedback signal and an existing extraction valve setpoint signal;

an extraction valve flow transition setpoint controller means operative with said extraction transition reference controller means for determining an extraction valve flow setpoint signal in said third or fourth transitional operating states in accordance with a predetermined function of said extraction transition reference signal, said flow feedback signal and said existing extraction valve setpoint signal; and

an extraction valve setpoint selection controller means operative with said extraction valve pressure transition setpoint controller means and said extraction valve flow transition setpoint controller means for selecting said extraction valve pressure setpoint signal in said first or second transitional operating states or said extraction valve flow setpoint signal in said third or fourth transitional operating states and establishing said existing extraction valve setpoint signal operative with said valve controller means at the value of said selected setpoint signal.

4,550,381

SPECTROMETER GUN

David A. Waechter; Michael A. Wolf, and C. John Umbarger, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 3, 1981, Ser. No. 317,816
Int. Cl.⁴ G06F *15/52*
U.S. Cl. 364—527 **5 Claims**

1. A hand-holdable battery-operated spectrometer gun comprising:

a barrel portion;

a main body portion;

a handle portion;

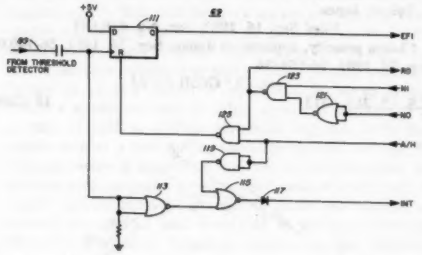
detection means housed in said barrel portion for detecting a signal from a source and for generating an electrical output signal representative thereof;

signal processing means housed in said main body portion for amplifying and shaping said electrical output signal of said detection means and for generating a digitized signal representative of said amplified and shaped electrical output signal;

control means housed in said main body portion for digitally processing and storing said digitized signal generated by said signal processing means and for controlling a display thereof;

display means housed in said main body portion for displaying said digitally processed and stored digitized signal of said control means, said display thereof being controlled by said control means; and

battery means for powering said detection means, said signal processing means, said control means, and said display means, said battery means including a battery source housed



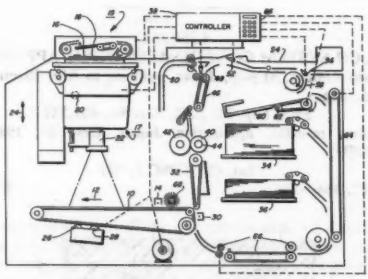
in said handle portion, a high voltage converter housed in said barrel portion powered by said battery source for powering said detection means, and a low voltage converter housed in said main body portion for powering said signal processing means, said control means, and said display means.

4,550,382

FILTERED INPUTS

Anthony M. Federico, West Webster; Ernest L. Legg; Stephen P. Wilczek, both of Fairport; Hari K. Prasad, Henrietta, and James J. Petery, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 21, 1982, Ser. No. 421,006
Int. Cl.⁴ G03G *15/00;* **G06F** *15/20*
U.S. Cl. 364—572 **10 Claims**



1. In a reproduction machine having a plurality of operating components, a machine control comprising

(a) a master controller including a processor and memory storage means,

(b) a communication channel,

(c) a remote controller connected to the master controller through the communication channel, the remote controller including a processor and memory storage for receiving switch and sensor signals from portions of the operating components of said machine, and

(d) filtering means connected to said remote controller, said filtering means filtering said signals before transmission from the remote controller to the master controller via the communication channel, the filtering means including the means to recognize a first signal transition of said switch and sensor signals, and the means to activate a timer for a

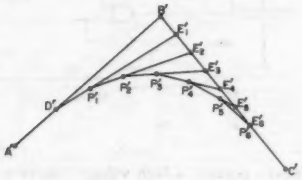
given period of time when the first transition is recognized.

4,550,383

PARABOLIC POSITION AND ATTITUDE INTERPOLATION FOR A ROBOT HAND

Koichi Sugimoto, Hiratsuka, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 16, 1982, Ser. No. 418,681
Claims priority, application Japan, Sep. 24, 1981, 56-149393; Sep. 24, 1981, 56-149394
Int. Cl.[4] G05B 19/42
U.S. Cl. 364—513 15 Claims



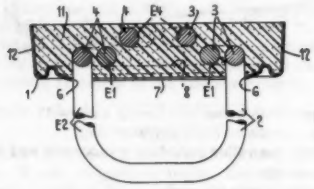
1. A control system for an industrial robot comprising a robot having a hand at an end of the robot; instruction means for providing a polygonal path defined by a plurality of straight lines which interconnect a plurality of point coordinates taught to said robot; arithmetical means for continuously interconnecting said straight lines by a parabola at predetermined locations in the vicinity of the centers of said straight lines, said parabola being generated by dividing a span between two predetermined positions through arithmetic linear interpolation technique in a manner in which points located between said predetermined positions are defined on a straight line interconnecting said two predetermined positions; and driving means for continuously moving said hand of the robot along said parabola generated by said arithemical means from a straight line to the next straight line.

4,550,384

TOUCH SYSTEM COORDINATES INPUT APPARATUS

Kiyoshi Kimura, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Sep. 30, 1982, Ser. No. 431,327
Claims priority, application Japan, Oct. 20, 1981, 56-155790[U]
Int. Cl.[4] G08C 21/00
U.S. Cl. 364—556 2 Claims



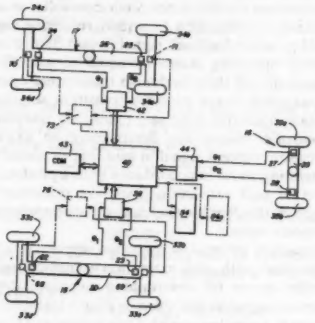
1. A touch panel for determining the coordinates for the point of application of pressure thereto, comprising a panel adapted to receive a pressing force applied thereto, means including a plurality of unitary straining portions formed integrally with said panel for developing component forces corresponding to said pressing force, means including respective detectors connected integrally to each said straining portion for developing signals suitable for processing to determine the point of application of said pressing force to said panel, wherein said straining portions are formed by strips of said panel formed by providing slots in marginal portions in said panel.

4,550,385

DYNAMIC LOW TIRE PRESSURE DETECTION SYSTEM FOR AIRCRAFT

Brian E. Pulk, Redmond, and Charles D. Bateman, Bellevue, both of Wash., assignors to Sundstrand Data Control, Inc., Rockford, Ill.

Filed Jul. 30, 1982, Ser. No. 403,437
Int. Cl.[4] B60C 23/00
U.S. Cl. 364—558 14 Claims



14. A low tire pressure detection system for detecting the presence of a low tire which supports a structural member of an aircraft moving on a surface comprising:

means, operatively connected to the structural member, for generating a frequency signal having a frequency component functionally related to the weight of the aircraft as the aircraft moves on the surface;

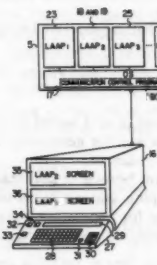
means for deriving a tire pressure signal from said frequency component.

4,550,386

TERMINAL CONTROLLER

Toshio Hirosawa, Machida; Masaru Ohki, Kodaira; Katuto Miyazaki, Hachioji; Nobuo Kobayashi, and Naoko Koizumi, both of Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 20, 1983, Ser. No. 563,614
Claims priority, application Japan, Dec. 22, 1982, 57-223818
Int. Cl.[4] G06F 3/14
U.S. Cl. 364—900 8 Claims



1. A terminal controller in combination with at least one video terminal for allowing concurrent operations of a plurality of application programs, each said application program

using an input/output data stream including an address information which enables to display data on the overall screen of a video terminal, comprising:

a plurality of input/output buffer means provided for said a plurality of application programs, respectively, to effect data input/output operation of said a plurality of application programs;

means for setting a screen split operation mode in response to a special control input information input from a video terminal connected to said terminal controller; and

conversion means for converting at least a part of a screen address information in an input/output data to be transferred between said a plurality of application programs and the video terminal when said screen split operation mode is set by said mode setting means, including first address conversion means for converting at least a portion of the screen address information in the input data stream input from said video terminal, so as to form input data streams each having an address information for the associated application program, and for transferring said input data streams to said respective buffer means provided for said a plurality of application programs, and second address conversion means for fetching a portion of an output data stream stored in each of said buffer means provided for said a plurality of application programs, and converting at least a portion of the address information included in said portion of a data stream, so as to compose an output data stream to be displayed on the overall screen of said video terminal;

whereby data output from said a plurality of application programs can be displayed in the split screen of the single video terminal.

4,550,387

CIRCUIT FOR DETECTING THE OCCURRENCE OF A PLURALITY OF SIGNALS IN A PREDETERMINED SEQUENCE

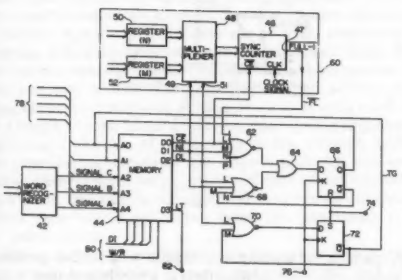
Kentaro Takita, Tokyo, Japan, assignor to Sony/Tektronix Corporation, Tokyo, Japan

Continuation of Ser. No. 404,193, Aug. 2, 1982, abandoned. This application Jan. 28, 1985, Ser. No. 695,425

Claims priority, application Japan, Dec. 15, 1981, 56-201784

Int. Cl.[4] G06F *3/00*; H03K *21/00*

U.S. Cl. 364—900 **9 Claims**



1. A signal sequence detection circuit for detecting the occurrence of a final signal following the occurrence of a selected sequence of K other signals, K being any positive integer of 2 or more, said circuit comprising:

K divide-by N counter means, each counter means for counting by one every time a signal is applied thereto and for generating an output signal when a count of N is reached, N being a positive integer the value of which can be independently selected for each of said K counter means; and

memory means including 2K+1 address terminals and at least K+1 data output terminals, one each of K of said address terminals for receiving said K other signals respectively, another one of said address terminal for receiving said final signal, and one each of the remaining K address terminals for receiving an output signal from the K counter means respectively, one each of K of said data output terminals being coupled to said K counter means respectively for applying said signal thereto, said memory means for storing predetermined output signal patterns in each storage location in accordance with said selected sequence such that said memory means generates a first output signal on a first of said K data output terminals when a first of said K other signals is applied to a first of said K address terminals of said memory means, a second output signal on a second of said K data output terminals when a second of said K other signals is applied to a second of said K address terminals together with the application of a first output signal of said first of said K counter means is applied to the first of said remaining K address terminals, and so forth until each of said K other signals are detected its selected N times and a signal is applied to each of said remaining K address terminals from the K counter means at which time said memory means generates an output signal at the (K+1)st data output terminal upon the occurrence of said final signal.

4,550,388

METHOD OF CONTROLLING STOP OPERATION OF ROTATING MAGNETIC FIELD FOR MAGNETIC BUBBLE MEMORY DEVICE

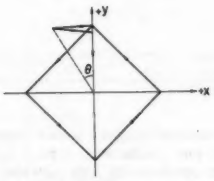
Takashi Toyooka, Sayama; Kazutoshi Yoshida, Mobara; Kazuhiro Ishida, Mobara; Tatsuo Okahashi, Mobara; Hirokazu Aoki, Hachioji; Ryo Suzuki, Kodaira, and Yutaka Sugita, Tokorozawa, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering Ltd., both of Tokyo, Japan

Filed Aug. 1, 1984, Ser. No. 636,671

Claims priority, application Japan, Aug. 3, 1983, 58-141230

Int. Cl.[4] G11C *19/08*

U.S. Cl. 365—6 **8 Claims**



1. A method of controlling a stop operation of a rotating magnetic field for a magnetic bubble memory device in which magnetic bubbles are propagated by said rotating magnetic field, comprising the steps of:

rotating said magnetic field beyond a predetermined direction by an angle in a range of 10 to 40 degrees;

rotating back said magnetic field until said magnetic field comes in said predetermined direction; and

removing said magnetic field when said magnetic field comes in said predetermined direction.

4,550,389

APPARATUS AND METHOD FOR SWITCHING A MAGNETIC DOMAIN LENS

David L. Cox, Valencia; William E. Ross, and Calvin A. Toche, both of Woodland Hills, all of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Aug. 15, 1983, Ser. No. 523,011

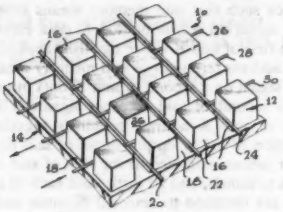
Int. Cl.[4] G11C *11/14, 11/42*

U.S. Cl. 365—37 **16 Claims**

1. In a magneto-optic device having a magnetic domain lens

including a plurality of separated geometric elements wherein each of the geometric elements contain a volume of magnetic material that is bistable or magnetically reversible and has an easy axis, the magnetic domain lens further comprising:

(a) first means establishing additive magnetic fields to nucleate a magnetic domain reversal in a selected geometric element, and



(b) second means establishing an aiding magnetic field to assist the propagation of a domain wall associated with the nucleated magnetic domain reversal through said selected element so that a desired degree of magnetic reversal of said element is completed.

4,550,390

SEMICONDUCTOR MEMORY DEVICE

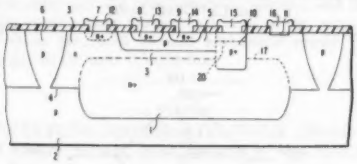
Tsutomu Akashi, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Apr. 7, 1982, Ser. No. 366,278

Claims priority, application Japan, Apr. 8, 1981, 56/52663

Int. Cl.⁴ G11C *11/40*

U.S. Cl. 365—174 **8 Claims**



4. A semiconductor memory device comprising a semiconductor body of one conductivity type, a semiconductor layer of the opposite conductivity type provided on said semiconductor body, a buried layer of said opposite conductivity type formed between said semiconductivity body and said semiconductor layer and having a higher impurity concentration than said semiconductor layer, a base region of said one conductivity type provided along a major surface of said semiconductor layer, said base region including a center portion and first and second side portions abutting against said center portion and having a lower impurity concentration than that of said center portion, said center portion being extended from said major surface of said semiconductor layer into said buried layer, said first and second side portions being separated from said buried layer, and a base electrode connected to the surface of said center portion of said base region.

4,550,391

DATA CAPTURE WINDOW EXTENSION CIRCUIT

Randall Chung, Laguna Niguel, and William Ambrosius, III, Mission Viejo, both of Calif., assignors to Western Digital Corporation, Irvine, Calif.

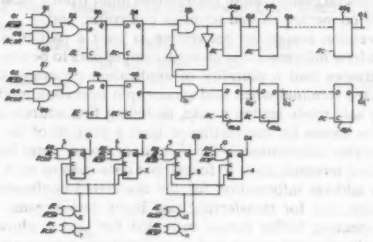
Filed Feb. 22, 1983, Ser. No. 468,129

Int. Cl.⁴ G11C *8/00*

U.S. Cl. 365—233 **4 Claims**

1. A digital data capture window extension circuit for optimizing the time available in an electronic system for detecting the presence and timing of a plurality of serial input signals from an external signal source, comprising:

a. alternately enabled first and second circuit means, each clocked at a frequency approximately the same as the frequency of the input signals, and each for detecting the presence and timing of an input signal from the external signal source while enabled, and for indicating such presence and timing by generating at least one of two timing signals; and



b. selection and storage means, coupled to receive the timing signals from the first and second circuit means, for storing a plurality of timing signals generated by one or both of the first and second circuit means indicative of the presence and timing of a plurality of serial input signals to one or both of the first and second circuit means.

4,550,392

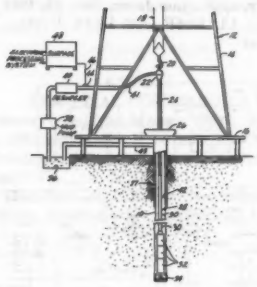
APPARATUS FOR WELL LOGGING TELEMETRY

Edward S. Mumby, Carmichael, Calif., assignor to Exploration Logging, Inc., Sacramento, Calif.

Filed Mar. 8, 1982, Ser. No. 355,921

Int. Cl.⁴ H04H *9/00*

U.S. Cl. 367—82 **19 Claims**



1. Apparatus for sending information to a surface pressure pulse detector through drilling fluid in a borehole drilled in the earth with a drill bit on the lower end of a drill string in the borehole and through which the drilling fluid is circulated to flow through the interior of the drill string, past the drill bit, and into an annulus between the drill string and the borehole wall, the apparatus comprising:

a retrievable assembly adapted to slide into and out of the drill string from the upper end of the drill string to a location near the drill bit, the assembly having a main bore with an inlet and an outlet through which a portion of the drilling fluid which flows through the drill string and past the drill bit may flow, the assembly being constructed and arranged so a first portion of the drilling fluid which flows through the drill string and past the drill bit may flow through the bore and a second portion of drilling fluid

may flow through a substantially fixed flow cross sectional area between the assembly exterior and the drill string when the assembly is in the drill string;

means for generating a control signal responsive to a downhole condition; and

means responsive to the control signal to change the rate at which drilling fluid flows through the bore and without changing the effective cross sectional area for fluid flow between the assembly exterior and the drill string to send a pressure pulse through the drilling fluid to the surface pressure pulse detector.

4,550,393

SYSTEM FOR REPRODUCING AN ADDRESS SIGNAL FROM EACH TRACK TURN DURING A SEARCH MODE OPERATION OF A REPRODUCING APPARATUS

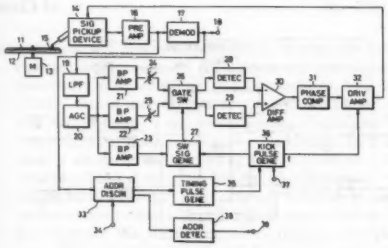
Hiroyuki Sugiyama, Isehara; Masaki Sakurai; Ryozo Abe, both of, Yokohama, and Kenji Yoshihara, Chiba all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed May 11, 1982, Ser. No. 376,970

Claims priority, application Japan, May 18, 1981, 56-74619

Int. Cl.[4] G11B *17/22*; H04N *5/76*

U.S. Cl. 369—32 **2 Claims**



1. An address signal reproducing system in a reproducing apparatus which comprises a reproducing element for reproducing elements from a rotary recording medium, said rotary recording medium having an address signal together with a program information signal recorded on track turns, said address signal comprising a time address signal which indicates the recorded position in terms of reproducing time and a chapter address signal which indicates the program number of the program information signal, each of said track turns being divided into n sections, where n is an even number greater than two, said time address signal and said chapter address signal being alternately recorded in the n sections of each track turn for a length of each of the n sections, said reproducing element traversing a plurality of track turns during a search mode of said reproducing apparatus in a manner such that said reproducing element scans only a portion of each of said plurality of track turns, said address signal reproducing system comprising:

kick pulse signal generating means for generating a kick pulse signal;

shifting means for performing tracking control with respect to said reproducing element and for shifting said reproducing element from one track turn to another track turn responsive to the kick pulse signal from said kick pulse signal generating means;

terminal means for receiving an external specifying signal which indicates the kind of address signal to be used;

switching signal generating means for generating a switching signal in response to a difference between the kind of address indicated by said external specifying signal and the kind of address presently being reproduced; and

timing signal generating means for selectively generating a first or second timing signal responsive to the switching signal from said switching signal generating means and for supplying the first or second timing signal to said kick pulse signal generating means, said first and second timing signals having a phase difference of To, each of said first and second timing signals comprising a pulse having a duration,

said kick pulse signal generating means stopping the generation of the kick pulse signal for said duration of the pulse of said first or second timing signal during which said search mode is switched to a normal reproduction mode,

said duration of the pulse of said first or second timing signal being greater than or equal to 2To so that said reproducing element scans over at least one complete section of the n sections in the normal reproduction mode of said reproducing apparatus, where To represents the reproducing time of the reproducting element for each address signal recorded in each of the n sections.

4,550,394

SYSTEM FOR OPTICALLY RECORDING INFORMATION

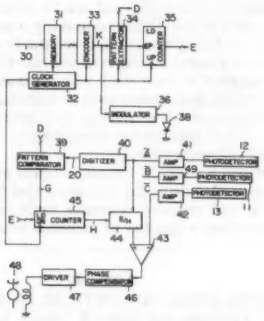
Takeshi Maeda, Kokubunji; Masahiro Takasago, Odawara, and Yoshito Tsunoda, Mitaka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 29, 1983, Ser. No. 479,894

Claims priority, application Japan, Mar. 31, 1982, 57-51234

Int. Cl.[4] G11B *7/00, 21/10*

U.S. Cl. 369—46 **8 Claims**



8. An optical recording system for recording information in a recording disc along predetermined recording tracks wherein a recorded area in the recording track which area is recorded with information hes different optical properties than an area in the recording track which area is not recorded with information, comprising:

means for recording information at a predetermined timing in the recording track;

monitor means for monitoring the position of the recording track including a preceding and a succeeding detector means spatially disposed before and after the recording means along the recording track;

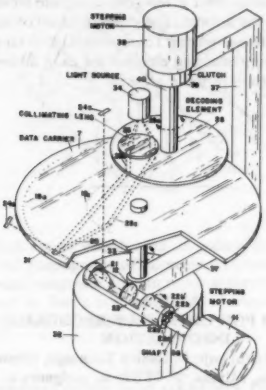
circuit means for controlling a timing of sampling of an output signal from said succeeding detector so as to detect a monitor signal in the interval of said predetermined timing, and holding the sampled signal;

means for comparing the output of said preceding detector and the sampled signal to produce a signal for enabling control of the positioning of the recording means.

4,550,395
HOLOGRAPHIC SYSTEM FOR THE STORAGE OF AUDIO, VIDEO AND COMPUTER DATA

John E. Carlson, 3440 E. Pontaluna, Fruitport, Mich. 49415

Division of Ser. No. 223,284, Jan. 8, 1981, Pat. No. 4,420,829.
This application Oct. 11, 1983, Ser. No. 540,248
Int. Cl.[4] G11B 7/00
U.S. Cl. 369—103 20 Claims



1. A data carrier for storage of data and adapted for data retrieval by playback apparatus,

said data carrier comprising a disc adapted for rotation about a carrier axis,

a plurality of arcuate signal tracks encircling said carrier axis, each of said tracks comprising a series of holograms with the holograms of adjacent tracks overlapping each other in a radial direction of said carrier,

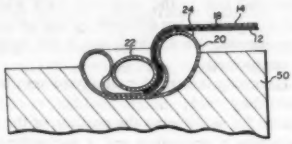
the holograms in each track being formed by the interference of an object beam with an encoded reference beam, the holograms which overlap each other in a radial direction of said data carrier being formed with different encoded reference beams,

each of said holograms forming a signal image upon illumination with a decoding reconstruction beam corresponding to said encoded reference beam, said signal image representing a quantity of recorded data.

4,550,396
RETAINING RINGS FOR OPTICAL DISK ASSEMBLIES

Robert P. Lehmann, and James E. Vianco, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 17, 1983, Ser. No. 458,492
Int. Cl.[4] G01D 15/32; G11B 5/82
U.S. Cl. 369—284 4 Claims



1. An optical disk assembly comprising:

A. a flexible, disk-shaped web assembly carrying a record layer, said web assembly having an information storage region and an annular peripheral region radially outward of said storage region; and

B. an annular retaining ring engaging said peripheral region of said web assembly, said retaining ring including

(1) a first ring member on one side of said web assembly, said first ring member having been formed from malleable stock material into a shape having an annular recess with

(a) a generally U-shaped cross-sectional shape open at the side facing said web assembly and

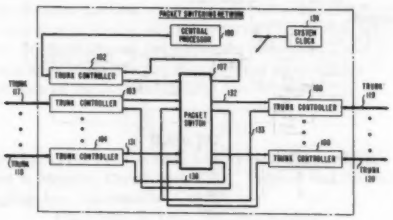
(b) an undercut area, and

(2) a second ring member formed from malleable stock material on the other side of said web assembly, said second ring member stock material having been deformed into said recess and said undercut area to provide a locking interfit with said first ring member, and with said annular peripheral region of said web assembly interleaved between the ring members in clamped circumferentially-symmetric tension.

4,550,397
ALTERNATE PATHS IN A SELF-ROUTING PACKET SWITCHING NETWORK

Jonathan S. Turner, University City, Mo., and Leonard F. Wyatt, Naperville, Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 16, 1983, Ser. No. 562,176
Int. Cl.[4] H04Q 11/04; H04J 3/00, 6/00
U.S. Cl. 370—60 16 Claims



1. A switching network for communicating packets each comprising address routing information from network input ports to network output ports, said network comprising a plurality of distribution stages and a plurality of routing stages

each of said distribution stages comprises a plurality of switch nodes each responsive to the receipt of one of said packets independent of said addressing routing information for alternating communicating said one of said packets to one of a subset of said nodes of a subsequent one of said stages; and

each of said routing stages comprises switch nodes each responsive to another receipt of said one of said packets and the address routing information of said one of said packets for communicating said one of said packets to another subsequent one of said stages.

4,550,398
MODULAR SELF-ROUTING PCM SWITCHING NETWORK FOR DISTRIBUTED-CONTROL TELEPHONE EXCHANGE

Piero Belforte; Enzo Garetti, and Luciano Pilati, all of Turin, Italy, assignors to Cselt - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

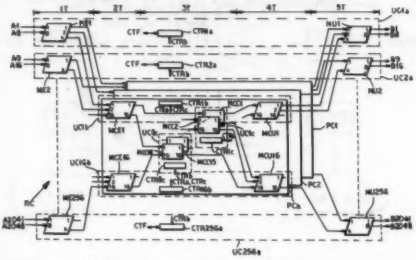
Filed Jun. 22, 1983, Ser. No. 506,709
Claims priority, application Italy, Jun. 22, 1982, 67790 A/82
Int. Cl.[4] H04J 11/04, 3/12
U.S. Cl. 370—66 12 Claims

1. In an automatic exchange of a telecommunication system for the selective transfer of exclusively PCM messages from a multiplicity of input lines to a like multiplicity of output lines, in combination:

a switching network divided into an odd number exclusively of timedivision stages each including a plurality of switch-

ing matrices individually connectable in cascade with matrices of an adjoining stage to set up forward-signaling paths for the transmission exclusively of PCM message words from given input lines to selected output lines, matrices of nonadjoining stages on opposite sides of a middle stage being structurally united into matrix pairs;

external control means for commanding the establishment and disestablishment of exclusively temporal connections between incoming and outgoing PCM channels by way of forward-signaling paths set up by said matrices; and



internal control means responsive to commands from said external control means for selectively establishing and selectively disestablishing said connections, said internal control means including common controllers for respective matrix pairs of said nonadjoining stages and central controllers for matrices of said middle stage, said internal control means further including ancillary circuitry bypassing the cascaded matrices for the transmission of routing instructions between said external control means, said common controllers and said central controllers in a direction opposite that of message-word transmission via interstage links forming part of said forward signaling paths.

4,550,399

ODYNAMICAL OPERATING RATE ALLOCATION PROCESS IN A MULTIPLEX COMMUNICATION SYSTEM

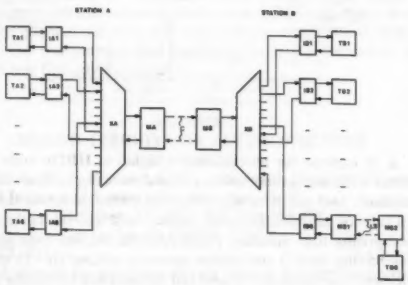
Francois G. Caron, Cagnes/Mer, France, assignor to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 12, 1983, Ser. No. 560,637

Claims priority, application European Pat. Off., Dec. 28, 1982, 82430049.5

Int. Cl.[4] H04J *6/02, 3/16, 15/00*

U.S. Cl. 370—80 **5 Claims**



1. A method for dynamically allocating the capacity of a communication system having a plurality of lines each of which can operate at any one of a number of information signaling rates selected from a set of information signaling rates (V1, V2, . . . , Vj) and in which the information signals on the plurality of lines are multiplexed onto a common channel having a maximum signaling rate Vc, said method including the following steps:

(a) measuring the number of significant information signals b_i^n passing through each of the lines during a time interval ϕ extending between times t_{n-1} and t_n;

(b) calculating for each line, an activity factor F_i^n at time tn according to the expression

$$F_i^n = b_i^n[\alpha + (1-\alpha)\cdot Vm/Vi]$$

in which

α is a coefficient between 0 and 1,

Vm equals the rate of the fastest line, and

Vi equals the rate of the line under consideration; and

(c) allocating the maximum information signaling rate Vc amongst all of the lines so that the deviation between the calculated activity factor for the lines and the allocated signaling information rate for the lines is minimized.

4,550,400

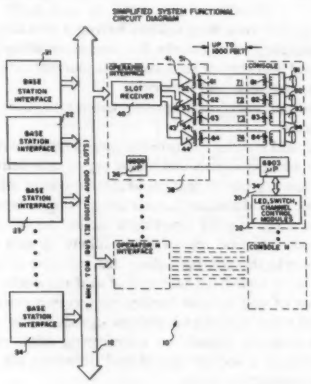
REMOTE DIGITAL VOLUME CONTROL SYSTEM

James A. Henderson, Jr., Streamwood, and Chris B. Tennant, Palatine, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 7, 1983, Ser. No. 511,612

Int. Cl.[4] H04J *3/02*

U.S. Cl. 370—85 **25 Claims**



1. A remote digital volume control system for use in an audio control apparatus comprising at least one TDM digital audio bus, which is coupled to a plurality of audio sources and which has a plurality of console interfacing circuits coupled thereto, and a plurality of remote consoles each having several channel control modules therein with the channel control modules in each remote console being coupled to one of said console interfacing circuits, said system comprising:

means, at each console, for generating a four-bit word for each volume control setting of each channel control module;

means for coupling said generating means to one of said console interface circuits;

means, included in each of said console interfacing circuits, for storing volume level information for each channel control module received from one of said remote consoles and routing information; and

means, included in each of said console interfacing circuits, for routing information from the respective digital/audio slots on said bus through audio line driver circuits to speakers in said console; said console intefacing circuits being controlled by said level and routing storing means and said routing means which cause appropriate digital-

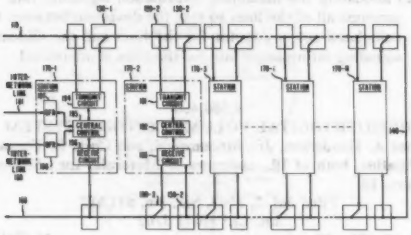
/audio slot information to be converted to an analog signal, muted to the desired level, and routed to a desired audio line driver circuit coupled to a speaker in a desired console.

4,550,401

DELIVERY INFORMATION PACKET SWITCHING SYSTEM

Danny R. Spears, Bolingbrook, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 21, 1983, Ser. No. 563,997
Int. Cl.[4] H04J *3/02, 3/00, 6/00;* **H04Q** *11/04*
U.S. Cl. 370—85 **16 Claims**



1. A packet switching system having a plurality of stations and a plurality of networks for communicating packets between said plurality of stations and a plurality of interconnection links between said networks;

each of said packets comprising delivery signals and address signals;

one of said stations comprising means responsive to a set of said address signals and a first set of said delivery signals for reading one of said packets from one of said networks;

said one of said stations further comprising means responsive to said reading for inserting a second set of said delivery signals into said one of said packets on said one of said networks thereby indicating that said one of said packets has been read from said one of said networks; and

said one of said stations further comprises means responsive to all other sets of said address signals and said first set of said delivery signals for transferring other ones of said packets to a second one of said networks via one of said interconnection links.

4,550,402

DATA COMMUNICATION SYSTEM

Melvin G. Gable, Ypsilanti, Mich.; Richard H. Sherman, Fremont, Calif., and Fumin Yuan, Canton, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 22, 1983, Ser. No. 564,611
Int. Cl.[4] H04J *3/02;* **H04Q** *11/04*
U.S. Cl. 370—85 **9 Claims**

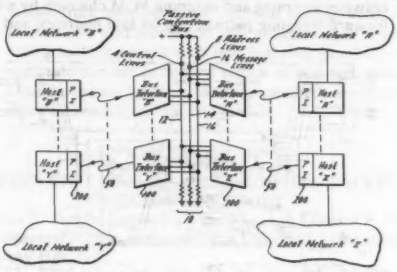
1. A data communication system to provide data transmission between a plurality of local computer networks comprising:

passive bus means, having a plurality of conductor lines dedicated to carrying defined address data, a plurality of conductor lines dedicated to carrying defined control signals and a plurality of conductor lines dedicated to carrying defined message data, for providing parallel interconnection of said plurality of local networks;

a plurality of means respectively connected between a separate correspondingly associated local network and said conductor lines of said passive bus means, for providing separate contention interface between each associated local network and said passive bus means;

means providing a data transmission link between each said contention interface means and its associated local network;

wherein each of said contention interface means includes a plurality of input/output ports connected to such corresponding dedicated conductor lines of said passive bus means and designated as address ports dedicated to parallel receiving and transmitting a set of address data bits, control ports dedicated to receiving and transmitting control signals, and data ports dedicated to parallel receiving and transmitting a set of message information data bits simultaneously with address data bits on said address ports.

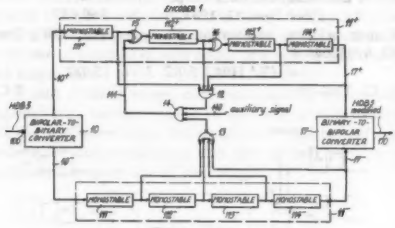


4,550,403

METHOD FOR TRANSMITTING A HDBn CODE SIGNAL WITH AN AUXILIARY BINARY SIGNAL IN A DIGITAL TRANSMISSION LINE AND SYSTEM FOR MONITORING REPEATERS IN THE LINE BY MEANS OF AUXILIARY SIGNALS

Claude P. Beynié , La Varenne, France, assignor to Societe Anonyme de Telecommunications, Paris, France

Filed Mar. 29, 1983, Ser. No. 479,905
Claims priority, application France, Mar. 29, 1982, 82 05327
Int. Cl.[4] H04J *3/12, 1/16, 3/14*
U.S. Cl. 370—110.1 **20 Claims**



1. A method for transmitting a signal in HBDn code combined with an auxiliary binary signal on a digital transmission medium, said auxiliary signal having a bit-rate lower than the bit-rate of said HDBn code signal, said HDBn code signal comprising four different predetermined HDBn code sequences having (n+1) successive elements whose (n−1) central elements are zeros and whose last element is a bipolarity violation mark, characterized in that in each of HDBn code sequences of (n+1) successive elements of said HDBn code signal that are transmitted during each of binary elements of said auxiliary signal having a predetermined binary state and that are identical to one of said predetermined HDBn code sequences, a predetermined bipolar mark included in said HDBn code sequence is permuted with a zero having a predetermined rank

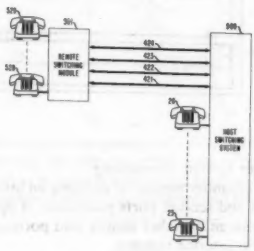
in said HDBn code sequence thereby deriving a modified sequence.

4,550,404

SWITCHING SYSTEM HAVING REMOTE SWITCHING CAPABILITY

Mark M. Chodrow, South Orange, N.J.; Bernard T. Sander, Jr., Naperville, Ill.; Charles H. Sharpless, Wayne, Ill., and Eugene J. Theriot, Naperville, Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 11, 1983, Ser. No. 493,683
Int. Cl.[4] H04J *3/12, 3/16*
U.S. Cl. 370—110.1 **32 Claims**



1. An arrangement comprising

interconnection means comprising a plurality of communications channels,

host switching means connected to said interconnection means comprising means for transmitting and receiving data words representing subscriber-generated information in ones of said communications channels, selection means for selecting ones of said communications channels, means responsive to a first selection by said selection means of any first given one of said communications channels for transmitting in a predetermined one of said communications channels, control information defining said any first given channel out of said plurality of communications channels and means responsive to said first selection by said selection means for transmitting and receiving control information in said any first given channel and

remote switching means connected to said interconnection means comprising means for transmitting and receiving data words representing subscriber-generated information in ones of said communications channels, means for receiving in said predetermined one of said communications channels, said control information defining said any first given channel out of said plurality of communications channels and means responsive to said control information defining said any first given channel out of said plurality of communications channels for transmitting and receiving control information in said any first given channel.

4,550,405

DESKEW CIRCUIT FOR AUTOMATIC TEST EQUIPMENT

Burnell G. West, Fremont, Calif., assignor to Fairchild Camera and Instrument Corporation, San Jose, Calif.

Filed Dec. 23, 1982, Ser. No. 452,608
Int. Cl.[4] H03K *5/00*
U.S. Cl. 371—1 **13 Claims**

1. A circuit for delaying signals having voltage transitions comprising:

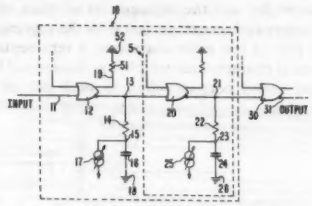
an input node to which the signals are supplied;

an intermediate output node;

a reference potential source;

interconnecting means coupled between the input node and the intermediate output node, the interconnecting means having a high output impedance for voltage transitions in a first direction, and a low output impedance for voltage transitions in an opposite direction;

a capacitor connected between the reference potential source and the intermediate output node; and



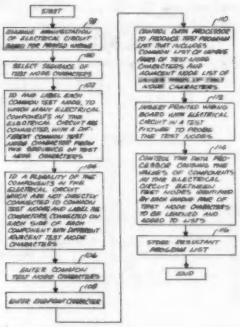
means, coupled to the capacitor, for discharging the capacitor at a controlled rate when voltage transitions are in the first direction and charging the capacitor when voltage transitions are in the opposite direction.

4,550,406

AUTOMATIC TEST PROGRAM LIST GENERATION USING PROGRAMMED DIGITAL COMPUTER

Thomas M. Neal, Brea, Calif., assignor to Everett/Charles Test Equipment, Inc., Pomona, Calif.

Filed Jun. 14, 1983, Ser. No. 504,270
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—20 **20 Claims**



1. A method using a digital data test program generator for generating a test program list for testing a printing wiring board having an electrical circuit, including components, thereon comprising the steps of:

inputting to the generator a common test node character in a sequence of test node characters;

inputting one of the test node characters as a last test node character in the same sequence of test node characters;

enabling the generator to form a representation of a common list of pairs of the test node characters, and each pair being unique, each pair comprising the common test node character;

enabling the generator to form a representation of an adjacent list of pairs of the test node characters, each pair being unique and comprising test node characters that are adjacent in the sequence of test node characters;

assigning each of individual ones of the pairs of test node characters in the common list and adjacent list to a corresponding pair of test nodes on the electrical circuit;

controlling the generator to sequentially apply a test signal between each of the pairs of test nodes identified in the common list and in the adjacent list on a sample of the

printed wiring board and from the test signal to determine a resultant electrical characteristic for the electrical circuit between each of the pairs of test nodes; and

controlling the generator to store a program test list comprising representations of at least some of the pairs in the common list and the adjacent list of pairs of test node characters and, in association with the representation for each pair of test node characters, a representation of an electrical characteristic which was determined for the pair of test noded corresponding to such pair of test node characters.

4,550,407

METHOD OF ANALYZING BROADCAST DATA, A NETWORK ANALYZER IMPLEMENTING SUCH A METHOD, AND RECEIVER EQUIPMENT USING SUCH AN ANALYZER

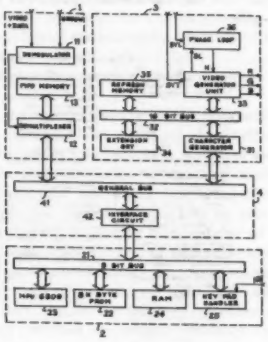
Tristan de Coussnon, and Jean L. Bellet, both of 173, Bl. Haussmann, 75008 Paris, France

Filed Jun. 14, 1983, Ser. No. 504,305

Claims priority, application France, Jun. 18, 1982, 82 10711

Int. Cl.[4] G06F *3/14*; H04N *7/08*

U.S. Cl. 371—29 **7 Claims**



1. A method of analyzing broadcast data which is encoded in a structure having a plurality of hierarchical levels, and which is intended to be interpreted and displayed by a videographic display terminal, wherein the method comprises:

a first step in which an operator instructs that data be selected from a given level and that said data be analyzed in a selected one from a plurality of analysis modes, said modes comprising: a "transparent" mode for extracting parameters present in the transmitted data and relating to characteristics of the data being broadcast; a "programmed" mode for measuring parameters relating to transmission conditions; and a "capture" mode for storing raw data as received prior to any processing or interpretation;

a second step in which the results of the selected analysis are prepared in a form of synthesized images which are encoded using a standard appropriate to said videographic display terminal, said images being representative of the parameters which have been extracted or measured or of the raw data stored before being interpreted; and

a third step of interpreting and displaying said results of the selected analysis as encoded using said videographic standard.

4,550,408

METHOD AND APPARATUS FOR OPERATING A GAS LASER

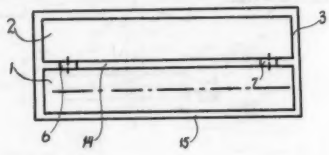
Heinrich Karning, Albert-Fritz-Str. 6, D-6900 Heidelberg; Franz Prein, Tulpenweg 3, D6901 Waldhilsbach, and Karl-Heinz Vierling, Johann-Sebastian-Bach-Str. 46, D-6901 Bammental, all of Fed. Rep. of Germany

Filed Feb. 22, 1982, Ser. No. 350,756

Claims priority, application European Pat. Off., Feb. 27, 1981, 81101440.6; Fed. Rep. of Germany, Jun. 11, 1981, 3123049

Int. Cl.[4] H01S *3/22*

U.S. Cl. 372—58 **16 Claims**



1. A fluid laser system, comprising:

(a) discharge chamber means for defining an interior volume having first and second ports positioned at opposing ends of said discharge chamber means, said ports communicating with said interior volume;

(b) first and second reflective members positioned at said opposing ends of said discharge chamber means and defining a resonant cavity with an optical axis;

(c) reservoir chamber means for defining an interior volume having third and fourth ports positioned at opposing ends of said reservoir chamber means, said ports communicating with said interior volume;

(d) first channel means extending between said first port and said fourth port for putting said discharge chamber means in communication with said reservoir chamber means;

(e) second channel means extending between said second port and said third port for putting said discharge chamber means in communication with said reservoir chamber means;

(f) an active fluid disposed throughout said discharge chamber means, said reservoir chamber means and said first and second channel means;

(g) excitation means coupled to said active fluid for exciting said active fluid to emit laser energy;

(h) first valve means for permitting flow of said fluid in said first channel means only in a direction from said discharge chamber means to said reservoir chamber means; and

(i) second valve means associated with said second channel means for permitting flow of said fluid only in a direction from said reservoir chamber means to said discharge chamber means.

4,550,409

INDUCED FLOW GAS TRANSPORT LASER

Alan S. Kaye, Wantage, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Sep. 1, 1982, Ser. No. 413,619

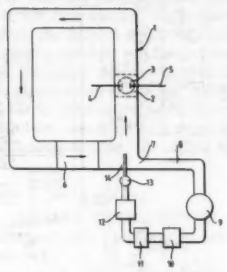
Claims priority, application United Kingdom, Sep. 17, 1981, 8128175

Int. Cl.[4] H01S *3/22*

U.S. Cl. 372—59 **6 Claims**

1. A transverse flow gas transport laser comprising, a loop of ducting including a lasing region which forms part of an optical cavity in which lasing action can take place, means for circulating a gaseous lasing medium around the loop of ducting, means for exciting the gaseous lasing medium in the lasing region of the ducting so as to cause lasing action to take place, wherein the means for circulating the gaseous lasing medium around the loop of ducting comprises means for extracting a portion of the gaseous lasing medium from a region of the

ducting other than the lasing region, compressing the said portion of the lasing medium and injecting it back into the remainder of the lasing medium via at least one nozzle so oriented that the injected lasing medium will issue from the



nozzle with it major component of velocity in the direction of and greater then the velocity of the flow of the lasing medium as a whole so as to induce flow of the gaseous medium through the lasing region of the ducting and around the loop of ducting.

4,550,410

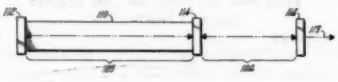
COUPLED-CAVITY LASER

Peter P. Chenausky, Avon; Nelson N. Hoffman, Tolland, and Lanny M. Laughman, Bolton, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 16, 1982, Ser. No. 369,298

Int. Cl.⁴ H01S *3/082*

U.S. Cl. 372—97 **4 Claims**



1. A coupled-cavity laser comprising:

a first optical cavity containing a gain medium;

a second optical cavity, having a coupling mirror at a first end of said second optical cavity and an optical element at a second end of said optical cavity opposite said first end of said second optical cavity, coupled to said first optical cavity, and forming a Fabry-Perot etalon having an etalon reflectivity and an etalon phase shift;

in which said etalon cavity is disposed outside said first optical cavity and controls the output power and frequency of the laser, wherein the improvement comprises:

said coupling mirror has a predetermined coupling reflectivity less than 20% and said optical element has an element reflectivity greater than 90%, whereby said etalon phase shift varies as a function of spacing between said coupling mirror and said optical element while said etalon reflectivity is substantially independent of said spacing.

4,550,411

SOURCES USED IN MOLECULAR BEAM EPITAXY

Paul R. Stonestreet, Buxted; David Williams, Tunbridge Wells; Kenneth Anderson, Buxted, and Peter J. L. Butcher, Lingfield, all of England, assignors to VG Instruments Group Limited, England

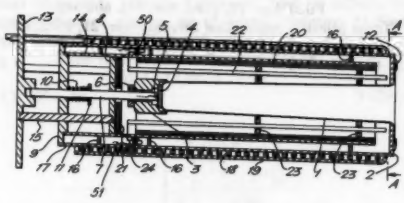
Filed Jun. 9, 1983, Ser. No. 502,628

Claims priority, application United Kingdom, Mar. 30, 1983, 8308786

Int. Cl.⁴ H05B *3/02*

U.S. Cl. 373—134 **12 Claims**

1. A molecular or atomic beam source for molecular beam epitaxy comprising a hollow crucible having an open end and a closed end, at least one substantially self-supporting heating element heating said crucible disposed outside of and spaced apart from said crucible, and electrical supply leads to enable electrical current to be passed through each heating element, each heating element being supported by means of insulated electrically conductive supporting means only at the closed end of said crucible, each heating element comprising at least



one pair of thin elongate metal strips extending substantially parallel to the axis of said crucible and disposed to present a major surface to the wall of said crucible, the strips of each pair being connected at the open end of said crucible by an electrically conductive link, and each of said strips being folded along one or more lines parallel to its longest edge in order to increase its resistance to bending.

4,550,412

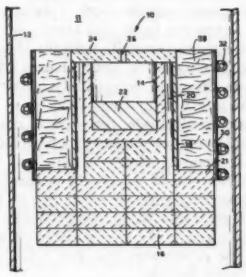
CARBON-FREE INDUCTION FURNACE

Cressie E. Holcombe; David R. Masters, both of Knoxville, and William A. Pfeiler, Norris, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 6, 1984, Ser. No. 568,770

Int. Cl.⁴ F27B *14/10*; H05B *1/16*

U.S. Cl. 373—155 **6 Claims**



1. A carbon-free induction furnace formed of carbon-free materials for providing a melt of a metal or alloy characterized by being essentially free of carbon impurities derived from furnace components; comprising:

a carbon-free refractory oxide crucible for containing a charge of metal or alloy;

a cylindrical susceptor of tungsten disposed about said crucible;

a cylinder of thermal insulatin disposed about said susceptor with said thermal insulation being of sufficiently low density to minimize induction heating thereof;

refractory oxide support means for supporting siad crucible;

electrical insulating means disposed about said thermal insulation; and

induction heating means arranged to inductively heat said susceptor through said electrical insulating means and said thermal insulation for heating said crucible and metal or

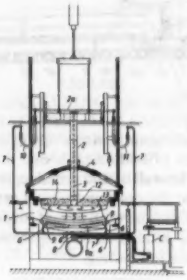
alloy contents therein to a temperature sufficient to provide a melt.

4,550,413

SYMMETRICAL CURRENT CONDUCTOR SYSTEM FOR A DC ARC FURNACE

Erik Lassander, Viken, and Sven E. Stenkvist, Västerås, both of Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed Apr. 17, 1984, Ser. No. 601,346
Claims priority, application Sweden, Apr. 21, 1983, 8302249
Int. Cl.[4] H05B *7/11*
U.S. Cl. 373—109 **1 Claim**



1. A DC arc furnace comprising a side wall and an electrically conductive hearth, a roof on top of the side wall and over the hearth, an arcing electrode depending through the roof, a plurality of electrical hearth connections extending through the hearth symmetrically with respect to the arcing electrode and each other, a DC power supply at a position horizontally offset from the furnace, a negative DC power conductor connecting with the arcing electrode and a positive DC power conductor connecting with the hearth connections; wherein the improvement comprises both of the conductors connecting with and extending from said supply to a point below the hearth and aligned vertically with the electrode, the negative conductor forming at the point at least two branches which extend from the point horizontally in opposite directions to beyond the side wall and upwardly so as to jointly connect with the arcing electrode, the positive conductor forming at the point at least two branches which extend horizontally from the point in opposite directions with one branch connecting with the other one of the hearth connections and the other branch connecting with the other one of the hearth connections, the branch lines being symmetrically positioned relative to each other and to the arcing electrode and hearth connections, and the conductors and their branch lines being in the form of straight lengths.

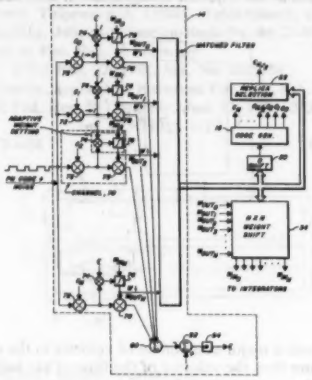
4,550,414

SPREAD SPECTRUM ADAPTIVE CODE TRACKER

Walter J. Guinon, Newburyport, and Richard H. Lamb, Jr., Somerville, both of Mass., assignors to Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Apr. 12, 1983, Ser. No. 484,302
Int. Cl.[4] H04B *15/00*
U.S. Cl. 375—1 **11 Claims**

11. A method for decreasing the signal acquisition and tracking time for parallel correlator spread spectrum receivers comprising the steps of ascertaining the degree of correlation for each of said correlators and thus the degree of correlation for the associated correlator channel, generating a weight directly proportional to the degree of correlation in the corresponding channel, said weight being continuously variable, and multiplying this output of each of said correlators with the corresponding generated weight, whereby said parallel correlator spread spectrum receivers are provided with adaptive continuously variable weights which narrow the receiver



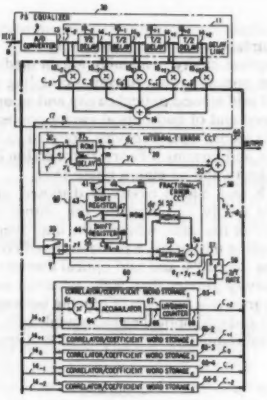
response upon an initial in-phase correlation in any one of said channels, thereby to suppress noise in correlators not containing the signal.

4,550,415

FRACTIONALLY SPACED EQUALIZATION USING NYQUIST-RATE COEFFICIENT UPDATING

Walter Debus, Jr., Nottingham, N.H. and Curtis A. Siller, Andover, Mass. assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 16, 1983, Ser. No. 552,415
Int. Cl.[4] H04B *3/14*
U.S. Cl. 375—14 **8 Claims**



1. An adaptive finite impulse response filter including
means for producing concurrent delayed versions of a received signal wherein the delayed versions of the received signal are temporally spaced apart by a fraction of a symbol interval in the received signal,
means for multiplying a plurality of said concurrent delayed versions of the received signal each by one of a plurality of coefficients to form a filtered received signal as
decision circuit means responsive to the filtered received signal for forming a decision as to the data symbol occur-

ring in the received data signal and for forming a corresponding error signal,

correlator means for updating each of said coefficients by multiplying said error signal and its associated one of said samples and accumulating the resulting product,

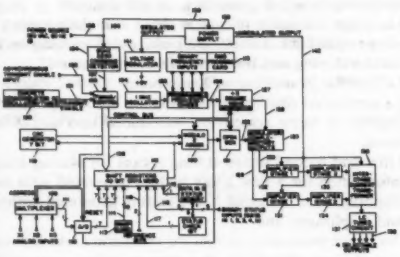
characterized in that the finite impulse response filter includes means for determining intermediate target values associated with the filtered received signal between the occurrence of data symbols and for forming an intermediate corresponding error signal indicative of the difference between the target value and actual value of the filtered received signal for alternative application to the correlator means with the corresponding error signal for updating said coefficients to adapt the digital filter.

4,550,416

DIGITAL TRANSMITTER

A. Rosanes, Centerport, N.Y., assignor to Hazeltine Corporation, Commack, N.Y.

Filed Jan. 31, 1983, Ser. No. 462,325
Int. Cl.⁴ H04J *3/16*
U.S. Cl. 375—59 **5 Claims**



1. An apparatus for transmitting, in digital form, first analog information provided at a first output, second analog information provided at a second output and third analog information provided at a third output, said apparatus comprising:

(a) first means for providing the first, second and third analog information;

(b) second means for converting the first, second and third analog information into digital information;

(c) sequencing means for providing the digital information in the following sequence: digital information corresponding to the first analog information followed only by identification information followed only by digital information corresponding to the second analog information followed only by data information followed only by digital information corresponding to the third analog information;

(d) third means for storing the sequenced digital information provided by the sequencing means and for providing the sequenced digital information in sequential order;

(e) said sequencing means comprising input means for inputting said digital information into said third means, said input means responsive to a timing control means controlling the order which said digital information in input into said third means so that the digital information is stored in said third means in the sequenced order;

(f) fourth means for modulating a carrier signal with the sequenced digital information provided by the third means, said fourth means comprising coding means for coding the stored digital information and a modulator having complementary outputs for modulating the carrier signal with the coded information;

(g) fifth means for transmitting the modulated carrier signal along a secondary of a power distribution network, said fifth means comprising an amplifier, an interstage current transformer associated with said amplifier and a tuned circuit associated with said transformer and having a plurality of selectable outputs connected to the secondary of a power distribution network; and

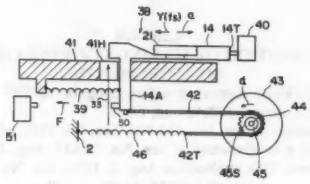
(h) timing means, responsive to a clock, for controlling the operation of the third means and the fourth means.

4,550,417

APPARATUS FOR COUNTING NUMBERS OF FINE PARTICLES

Yoshiaki Nunogaki; Tetsuya Kobayashi, both of Kyoto, and Yasutaka Kosuge, Osaka, all of Japan, assignors to Sanki Engineering Co., Ltd., Kyoto, Japan

Filed Oct. 15, 1982, Ser. No. 434,487
Int. Cl.⁴ G06M *11/02*
U.S. Cl. 377—10 **3 Claims**



1. An apparatus for counting numbers of fine particles, comprising:

transparent sample plate means for containing a sample of fine particles to be counted, said sample plate means having a shape adapted to arrange said fine particles all on the same level across said plate without superposition;

an optical system adapted to irradiate parallel light beams along an optical axis through said sample plate means for producing optical silhouetted images of said fine particles contained thereon and for magnifying and projecting said silhouetted images, and having self scanning charge coupled device (CCD) photoelectric converter means including a plurality of photoelectric elements arranged operably in a linear row array, said projected silhouetted images of said fine particles being magnified such that a projected image of a single fine particle has a dimension in the range of from one to five microns so as to substantially cover a single said photoelectric element, said photoelectric converter means being adapted to convert said magnified silhouetted images of said fine particles projected onto said photoelectric elements thereof into signal charges, said signal charges being transferred serially along the direction of said linear row array;

drive means adapted to cause scanning motion of said sample plate means in a plane perpendicular to said optical axis of said optical system and in a direction perpendicular to said direction of said linear row array, and at a speed permitting scanning by said photoelectric converter means in said direction of said linear row array of said silhouetted images projected thereon as said sample plate means is moved, said drive means including sample holder means for holding said sample plate means, synchronous motor means operably coupled to said sample holder means for driving said sample holder means and spring means urging said sample holder means toward a direction in which said motor means drives said sample holder means, the urging force of said spring means on said sample holder being equal or greater than a rated driving torque of said motor means to a degree necessary for maintaining synchronous rotation of said motor means; and

counting and output means for counting the numbers of said signal charges transferred serially along the direction of said linear row array of said photoelectric converter means which have a charge value greater than a predetermined charge threshold value and for summing said numbers of said charge signals exceeding said threshold value

during said scanning motion of said sample plate means, and for outputting an output data signal representative of said summed number of said charge signals exceeding said threshold value.

4,550,418

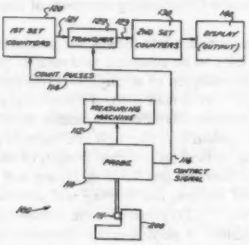
METHOD OF MAKING COORDINATE MEASUREMENTS

Jerome E. Deis, Kettering, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Continuation of Ser. No. 431,514, Sep. 30, 1982, abandoned, which is a continuation of Ser. No. 71,623, Aug. 31, 1979, abandoned. This application Aug. 1, 1984, Ser. No. 636,793

Int. Cl.⁴ H03K *13/02, 21/02*

U.S. Cl. 377—17 **3 Claims**



1. A method of measuring an object with a machine having a probe, said method comprising the steps of

moving the probe and object relative to each other, said step of moving the probe and object relative to each other including the step of moving the probe and object into engagement and continuing the relative movement between the probe and object for at least a short time after their engagement,

generating signals during all of the relative movement between the probe and object with each signal being indicative of an increment of relative movement between the probe and object,

transmitting all of the signals generated during relative movement between the probe and object to a first data storage unit,

storing in the first data storage unit data corresponding to each of the signals generated during relative movement between the probe and object,

transmitting from the first data storage unit to a second data storage unit data indicative of the position of engagement of the probe and object,

displaying the data indicative of the position of engagement of the probe and object, and

maintaining the displayed data constant during the continued relative movement between the probe and object after their engagement so that the displayed data is indicative of the relative position of the probe and object at the time of engagement even though the relative movement between the probe and object continues for at least a short time after their engagement.

4,550,419

DIAGNOSTIC RADIOLOGY SETUP WITH MEANS FOR SUPPRESSING STRAY RADIATION

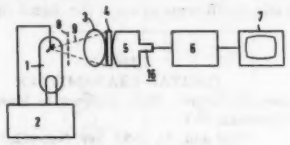
Horst Aichinger, Fuerth; Paul Marhoff, and Manfred Pfeiler, both of Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 19, 1983, Ser. No. 543,208

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1983, 3304213

Int. Cl.⁴ A61B *6/00;* **H04N** *5/32*

U.S. Cl. 378—099 **7 Claims**



1. A diagnostic radiology set up for suppressing stray radiation components which comprises, in combination:

(a) an image intensifier television chain, said chain having an image intensifier, a television camera and viewing means for developing and presenting an X-ray picture;

(b) a tube for generating an X-ray beam;

(c) a perforated diaphragm of radiation absorbing material capable of being selectively introduced into said X-ray beam;

(d) first and second image storing means for storing image information for a first X-ray picture generated with said diaphragm and a second X-ray picture generated without said diaphragm; and

(e) an image processing system for comparing said first and second X-ray pictures so that stray radiation components may be identified and eliminated to generate a stray radiation free X-ray picture.

4,550,420

APPARATUS FOR RECORDING X-RAY RADIATION PICTURES, IN PARTICULAR IN THE COSMIC SPACE

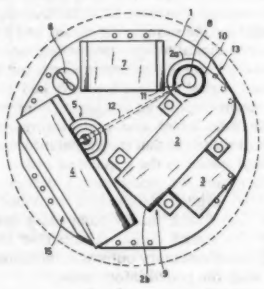
Günther Otto, and Gert Warmbold, both of Cologne, Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V., Cologne, Fed. Rep. of Germany

Filed Nov. 9, 1983, Ser. No. 550,482

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1982, 3242078

Int. Cl.⁴ G03B *41/16*

U.S. Cl. 378—171 **22 Claims**



1. Apparatus for recording X-ray radiation pictures in space, comprising:

a common base plate,

an X-ray radiation source, a high voltage supply for said X-ray radiation source, a photographic recording unit, and a sample holder adjacent to said photographic recording unit, all mounted on said base plate,

an angular common housing on said base plate, said X-ray radiation source being housed in a first leg of said housing and said high voltage supply being housed in a second leg of said housing,

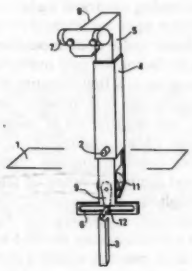
the aperture of said X-ray radiation source being positioned so that X-rays from said source are directed at an acute angle relative to said second leg of said housing toward said sample holder and recording unit, said recording unit being situated in the vicinity of the free end of said second leg of said housing.

4,550,421

RADIOLOGY TABLE FOR EXPOSURES WITH VARIABLE TILTING ANGLE AND SOURCE-PATIENT DISTANCE AND FOR TOMOGRAPHY

André E. Louiday, Le Pecq, France, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 387,123, Jun. 10, 1982, abandoned. This application Mar. 26, 1984, Ser. No. 593,185
Claims priority, application France, Jun. 12, 1981, 8111621
Int. Cl.⁴ G03B *41/16*
U.S. Cl. 378—196 **7 Claims**



1. A radiology table comprising:

a frame;

a table top supported by the frame;

a column having a longitudinal axis, said column comprising a tubular base and a telescopic part slidable inside the tubular base along the longitudinal axis, said base having a fixed length and being mounted on the frame so as to be pivotable about a tilt axis which is perpendicular to the longitudinal axis, said column having first and second ends on opposite sides of the tilt axis;

an X-ray source mounted on the telescopic part of the column at the first end of the column;

a motor mounted on the tubular base of the column;

a shaft having a shaft axis which is parallel to but spaced from the tilt axis, said shaft being rotatable about the shaft axis by the motor;

a crank, rotatably mounted on the tubular base of the column for rotation around the shaft axis, said crank having a crank pin displaced from the shaft axis;

a stationary guide secured to the frame and engaging the crank pin such that rotation of the crank causes the column to pivot about the tilt axis; and

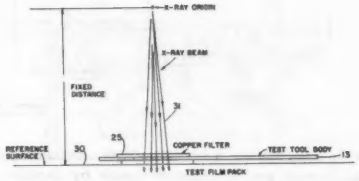
a movable guide connected to the telescopic part of the column and engaging the crank pin such that rotation of the crank pin causes the telescopic part of the column to slide within the tubular base of the column.

4,550,422

PROCESS AND DEVICE FOR X-RAY SYSTEM QUALITY ASSURANCE

Wilbur F. VanPelt, and Richard W. Peterson, both of Seattle, Wash., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Nov. 10, 1982, Ser. No. 440,728
Int. Cl.⁴ G01T *1/16*; H05G *1/26*
U.S. Cl. 378—207 **13 Claims**



EXPOSE SAMPLE X-RAY FILM TO RADIATION FROM THE X-RAY SOURCE THROUGH A FILTER ELEMENT TO PROVIDE A PREDETERMINED DEGREE OF EXPOSURE
DEVELOPE THE EXPOSED TEST FILM
COMPARE THE DENSITY OF THE DEVELOPED FILM WITH SELECTED STEP DENSITIES OF A DENSITY STEP TABLET TO DETERMINE IF THE TEST FILM DENSITY CAN BE MATCHED IN DENSITY WITH STEP DENSITIES CORRESPONDING TO THOSE OBTAINABLE FROM AN OPERATIONALLY NORMAL CONDITION OF THE SAME EQUIPMENT AND EXPOSURE TECHNIQUE FACTORS

1. An x-ray generator test tool comprising housing means formed of optically opaque material having a top wall and a spaced parallel bottom wall, means defining a linear channel between said walls, an optical density step tablet slidably disposed in said linear channel and having a plurality of successive step segments graduated in optical density, means defining a transverse channel extending from one edge of said housing means perpendicular to and communicating with said linear channel, said transverse channel being adapted to receive a test film for comparison with said optical density step segments, means defining light-transmitting windows in said housing means simultaneously exposing said linear and transverse channels at the region where the transverse channel communicates with the linear channel, and

x-ray filter means comprising a thin copper plate secured on one of said walls and for filtering clinical x-ray kilovoltages of 70 kV-100 kV mounted on said housing means at a non-interfering location relative to said windows.

12. A method of evaluating the performance of an x-ray system comprising exposing a conventional x-ray film, used as a test film, to radiation from the x-ray generator at predetermined exposure technique factors through a filter element selected to normally provide a predetermined degree of exposure, developing the exposed test film, and comparing the density of the developed test film with the density steps of a density step tablet to determine if the test film can be matched in density with step densities corresponding to those obtainable from an operationally normal condition of the x-ray system at said same exposure technique factors, using the same filter element.

4,550,423

STEREO MPX CIRCUIT

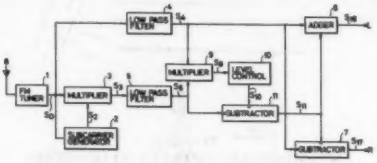
Michinori Naito, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 3, 1984, Ser. No. 576,905

Claims priority, application Japan, Feb. 9, 1983, 58-18753; Feb. 24, 1983, 58-28433

Int. Cl.⁴ H04H *5/00*

U.S. Cl. 381—13 **3 Claims**



1. In combination, a stereo multiplex circuit for outputting right-channel and left-channel signals by decoding a stereo composite signal;

a circuit for multiplying signals consisting of said right-channel and left-channel signals;

a circuit for receiving an output signal of said multiplier and for adjusting the level of the magnitude, thereby to output; and

a circuit for inserting an output signal of said level control circuit into the right and left channels to compensate high-order harmonic distortion in the right and left channels,

wherein a level ratio of input/output of said level control circuit is set to a value so as to minimize the high-order harmonic distortion in the right and left channels existing prior to insertion of the output of said level control circuit into the right and left channels by said inserting circuit.

4,550,424

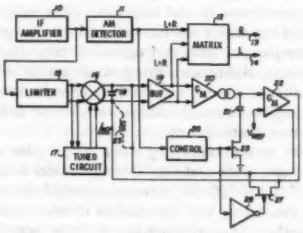
PM DECODER SAMPLE AND HOLD CIRCUIT

Fred T. J. Cheng, and Don R. Sauer, both of San Jose, Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Feb. 9, 1984, Ser. No. 578,403

Int. Cl.⁴ H04H *5/00*

U.S. Cl. 381—15 **8 Claims**



6. A phase modulation (PM) detector circuit for responding to an input signal that contains phase related information and to provide an output that contains said information, said circuit comprising:

a PM detector having an input coupled to receive a phase modulated signal and an integrated output;

means for simulating an inductor coupled to said integrated output;

means for disabling said inductor to achieve a sample and hold function for said phase modulated signal.

4,550,425

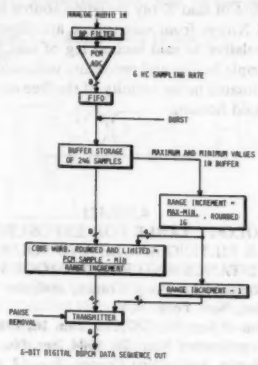
SPEECH SAMPLING AND COMPANDING DEVICE

David P. Andersen, Burnsville; Raymond C. Hedin, Apple Valley, and John F. Siebenand, Eagan, all of Minn., assignors to Sperry Corporation, New York, N.Y.

Filed Sep. 20, 1982, Ser. No. 420,545

Int. Cl.⁴ G10L *1/00;* **H03K** *13/22*

U.S. Cl. 381—30 **13 Claims**



1. A method for the digital encoding of an analog electrical signal representing speech comprising:

digitalizing said analog electrical signal at a sampling rate in order to produce upon an interval of time a multiplicity, or block, of linear pulse code modulated samples;

computing a scale factor for said multiplicity of pulse code modulated samples as a first quantity divided by a second quantity, wherein siad first quantity equals the maximum valued one of said multiplicity of samples minus the minimum valued one of said multiplicity of samples while said second quantity equals a constant number; and

generating, as said digital encoding of said analog electrical signal, a multiplicity of successive ones of digital code words wherein each successive one digital code word is formulated as a third quantity divided by said scale factor, wherein said third quantity equals a corresponding one of said multiplicity of pulse code modulated samples minus said minimum valued one of said multiplicity of samples;

whereby said method of digital encoding is called Block-Scaled Pulse Code Modulation because a multiplicity, or Block, of Pulse Code Modulated samples are Scaled by a factor, a scale factor, which scale factor is computed in consideration of the dynamic range of said multiplicity, or Block, of Pulse Code Modulated Samples.

4,550,426

METHOD AND MEANS OF DETECTING THE PRESENCE OF A SIGNAL REPRESENTING VOICE AND OF COMPRESSING THE LEVEL OF THE SIGNAL

Steven F. Gillig, Carol Stream; George H. Fergus, Schaumburg, both of Ill., and Michael F. Barnes, Mendon, N.Y., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 336,191, Dec. 31, 1981, abandoned. This application Dec. 11, 1984, Ser. No. 680,444

Int. Cl.⁴ G10L *1/00*

U.S. Cl. 381—46 **10 Claims**

1. A circuit for compressing an audio signal from a signal source and for detecting a voice signal in the audio signal, the circuit comprising:

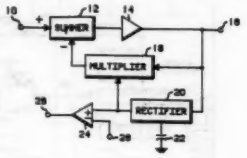
a syllabic compressor for operating on the audio signal to produce a compressed output signal, said syllabic compressor comprising:

a syllabic rectifier for receiving said compressed output signal and for producing an average envelope voltage

comprising the average envelope of said compressed output signal;

a multiplier for receiving said compressed output signal and said average envelope voltage and for providing a feedback signal; and

a summer coupled to the signal source and said feedback signal to provide said compressed output signal;



a reference source for producing a reference voltage; and

a comparator coupled to the reference source and the syllabic compressor for comparing the average envelope voltage and the reference voltage and producing an output signal indicating that a voice signal is present in the auido signal when the average envelope voltage is greater than the reference voltage.

4,550,427

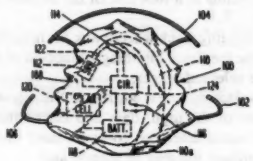
ARTIFICIAL LARYNX

Philip Katz, Princeton Junction; Henry S. Brenman, Cinnaminson, both of N.J.; Louis D. Lowry, Villanova, and Harold Schwartz, King of Prussia, both of Pa., assignors to Thomas Jefferson University, Philadelphia, Pa.

Continuation-in-part of Ser. No. 249,140, Mar. 30, 1981, Pat. No. 4,473,905. This application Nov. 1, 1982, Ser. No. 438,376

Int. Cl.⁴ A61F *1/20*

U.S. Cl. 381—70 **8 Claims**



1. An intraoral artificial larynx, comprising:

(a) prosthetic means for mounting said larynx within the oral cavity;

(b) a power source mounted on said prosthetic means;

(c) signal generation means mounted on said prosthetic means for generating a preselected electrical signal; and

(d) speaker means mounted on said prosthetic means for converting said signal into acoustic energy;

(e) duty cycle control means for reducing the duty cycle of said signal prior to its input to said speaker means to produce a conditioned signal;

(f) a tongue activatable switch;

(g) switched timing means for enabling said speaker means in response to a timed closure of said switch, said switched timing means comprising a timer and a bistable flip-flop responsive through NAND gates to the output of said timer and one of said signals.

4,550,428

DRIVER UNIT FOR AUTOMOTIVE AUDIO SPEAKER

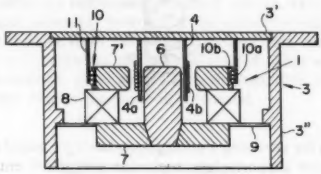
Takayuki Yanagishima; Junichi Kasai, both of Yokosuka; Akio Ajimine, Tokyo; Tatsuya Watanabe, Tokyo; Akimitsu Shino, Tokyo, and Yoshiaki Murakami, Tokyo, all of Japan, assignors to Nissan Motor Company, Limited and Clarion Co. Ltd., both of, Japan

Filed Jun. 2, 1983, Ser. No. 500,573

Claims priority, application Japan, Jun. 8, 1982, 57-98055

Int. Cl.⁴ H04R *9/00*

U.S. Cl. 381—86 **9 Claims**



1. A speaker for an automotive audio system, comprising:

a housing;

a first component received within said housing and associated with a sound-producing medium for driving the latter, said first component responsive to an audio signal to be energized and deenergized at a frequency corresponding to the audio sound to be reproduced, and said first component being movable along an axis of the speaker depending upon energization and deenergization thereof;

a second component resiliently suspended within said housing and positioned in a given relationship to said first component, said second component producing a permanent magnetic field therearound through which said first component moves depending upon energization and deenergization thereof, said second component being movable relative to said first component while the latter moves with respect to said magnetic field; and

means, associated with said second component, for guiding movement of said second component and restricting movement of said second component in a lateral direction relative to said axis, said guiding means comprising a guide member cooperative with said second component and coaxial with said first component, and a bearing associated with said guide member and said second component for allowing axial movement of said guide member while preventing movement thereof perpendicular to the axis thereof.

4,550,429

SHOCK ABSORBING TRANSDUCER MODULE

Raymond W. Burbank, North Lauderdale, and Christopher A. Myers, Boca Raton, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 3, 1983, Ser. No. 500,722

Int. Cl.⁴ H04R *1/02*

U.S. Cl. 381—90 **14 Claims**

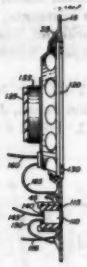
1. A modular transducer mounting assembly, comprising:

a substantially planar support plate having a rear surface;

a shock absorbing cushion, said cushion being substantially planar and attached to said rear surface of said support plate for isolating said plate from mechanical shock while urging said support plate forward when said cushion is compressed from the rear;

said support plate including an aperture and a rearward angular bevel around the perimeter of said aperture;

a loudspeaker, positioned in said aperture and cradled by said rearward angular bevel;



means for attaching a microphone having a sound entry port to said support plate, such that said sound entry port is substantially unobstructed acoustically; and

a microphone connected to said attaching means.

4,550,430

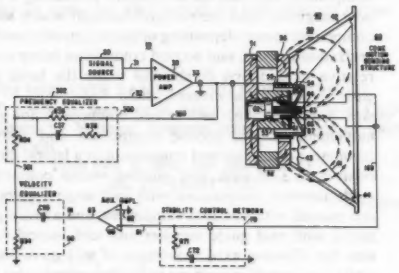
SOUND REPRODUCING SYSTEM UTILIZING MOTIONAL FEEDBACK AND AN IMPROVED INTEGRATED MAGNETIC STRUCTURE

Stanley T. Meyers, 122 N. Riverside Ave., Red Bank, N.J. 07701

Filed Feb. 20, 1981, Ser. No. 236,276

Int. Cl.[4] H04R *3/08, 9/06*

U.S. Cl. 381—96 **11 Claims**



7. In a loudspeaker structure, the combination comprising:

a main electromagnetic structure exhibiting a stray magnetic field and further comprising a sound producing member and an inner pole piece having an inner diameter; and

means for sensing the motion of said sound producing member comprising:

an iron member being located radially inward relative to said inner pole piece inner diameter, said iron member being responsive to said stray magnetic field for forming a magnetic field path to and from said main electromagnetic structure; and

feedback means being fixedly attached to said sound producing member and moving uniformly therewith and being located in between said inner pole piece inner diameter and said iron member for sensing the motion of said sound producing member;

wherein said motion sensing means further comprises a non-magnetic electrically conductive member being located in between said feedback means and said iron member.

4,550,431

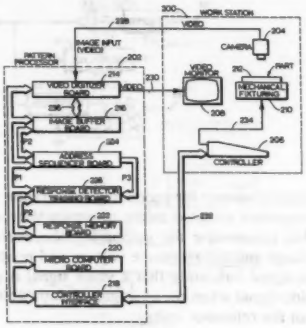
ADDRESS SEQUENCER FOR PATTERN PROCESSING SYSTEM

Larry J. Werth, Eagan, and Larry G. Paulson, Moundsview, both of Minn., assignors to Pattern Processing Technologies, Inc., Minneapolis, Minn.

Filed Feb. 7, 1983, Ser. No. 464,588

Int. Cl.[4] G06K *9/00*

U.S. Cl. 382—1 **35 Claims**



1. Apparatus for generating an address stream which includes a plurality of interleaved sequences of addresses, the apparatus comprising:

means for providing a sequence identification number which identifies a selected sequence of the plurality of sequences;

means for providing an address of the selected sequence in response to the sequence identification number;

means for providing input data in response to the address of the selected sequence;

shift register means for containing bits in a plurality of stages, the bits being initially based upon the address of the selected sequence;

means for shifting the contents of the shift register means by a predetermined number of stages;

means for deriving bits from selected stages of the shift register means as a function of the sequence identification number;

means for feeding back a feedback bit into the shift register means, the feedback bit being a function of the bits derived from the selected stages;

means for selecting a next address in the selected sequence as a function of the input data and the contents of the shift register means after the contents have been shifted by a predetermined number of stages; and

means for storing the selected next address for use when the sequence identification number is again provided.

4,550,432

IMAGE PROCESSOR USING A MOMENT GENERATOR

Russell L. Andersson, Lawrenceville, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 13, 1983, Ser. No. 484,543

Int. Cl.[4] G06K *9/52*

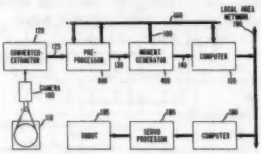
U.S. Cl. 382—1 **14 Claims**

1. An image processor adapted to identify source image signals, said image signals being composed of a plurality of picture elements and representing a physical object CHARACTERIZED IN THAT said image processor comprises:

means for extracting synchronization signals from said image signals, said image signals being multilevel weight signals,

means responsive to said synchronization signals and said

image signals for selectively modifying said image signals, and



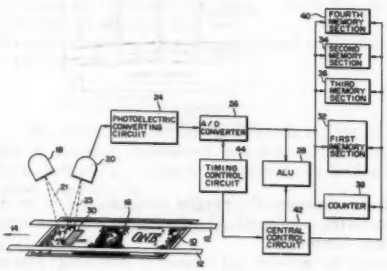
means for iteratively and recursively generating a moment of a preselected order greater than zero of said selectively modified image signals.

4,550,433

APPARATUS FOR DISCRIMINATING A PAPER-LIKE MATERIAL

Hisashi Takahashi, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Aug. 31, 1983, Ser. No. 528,106
Claims priority, application Japan, Sep. 27, 1982, 57-166584
Int. Cl.[4] G06K 9/03
U.S. Cl. 382—7 **4 Claims**



1. An apparatus for discriminating the physical condition of a paper like material comprising:

optical scanning means for projecting scanning light toward a detection area of the paper-like material which is being conveyed through the optical scanning means, said optical scanning means including a light source and a light receiver which are arranged such that the light radiated from the light source is directed to the detection area of the paper-like material and then reflected back to the light receiver;

photoelectric converting means for converting an optically scanned signal from the optical scanning means into an electric analog signal whose level is substantially in proportion to the level of the optically scanned signal;

analog/digital converting means for converting the electric analog signal into a digital signal;

timing control means for applying sampling pulses to the analog/digital converting means so to produce a sampled digital value from the analog/digital converting means;

storing means for storing at least a first presettable value, smaller than a maximum value of the sampled digital value, which is used to discriminate a physical condition of the paper-like material, said storing means including a first memory section which stores the sampled digital value as an input pattern data and a standard digital value obtained as a standard pattern data from a standard paper-like material, and a second memory section which stores the first presettable value; and

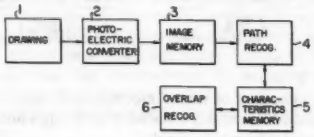
arithemetic operation means for (a) calculating an average value of the input pattern data, (b) subtracting the averaged input pattern data value from the standard pattern data value, (c) correcting the input pattern data by the averaged value, (d) subtracting the corrected input pattern data value from the standard pattern data value, and finally (e) comparing the thus subtracted value with the first presettable value so as to discriminate defects in the detection area of the paper-like material.

4,550,434

LINE RECOGNITION

Shigeru Shimada; Shigeru Kakumoto, both of Kodaira, and Osamu Abe, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 13, 1983, Ser. No. 494,445
Claims priority, application Japan, May 14, 1982, 57-79942
Int. Cl.[4] G06K 9/20
U.S. Cl. 382—9 **25 Claims**



1. A method for recognizing various kinds of lines drafted on a drawing in an apparatus which recognizes the lines based upon an image data signal obtained by scanning the drawing, comprising the steps of:

recognizing lines and overlap symbols drafted on the drawing, based upon the image data signal, to obtain data representative of a position and a line kind of each of the lines and data representative of a position and a symbol kind of each of the overlap symbols, wherein said lines and said overlap symbols are drafted on the drawing in such a manner that when at least two lines to be drafted overlap each other along a path, only one of the two lines is drawn along the path, and an overlap symbol is attached to the one line at a point along the path in order to represent presence of the other line not drawn, said overlap symbol being determined depending upon a line kind of the other line not drafted; and

generating data representative of positions and line kinds of lines not drawn on the drawing but represented by the recognized overlap symbols, based upon the obtained data.

4,550,435

MULTILEVEL THRESHOLDING FOR TARGET TRACKING APPARATUS

Julius Hayman, Viscentown, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 7, 1983, Ser. No. 501,869
Int. Cl.[4] G06K 9/34
U.S. Cl. 382—9 **5 Claims**

1. A method for segmenting target information accompanying background information in a video signal, said method comprising the steps of:

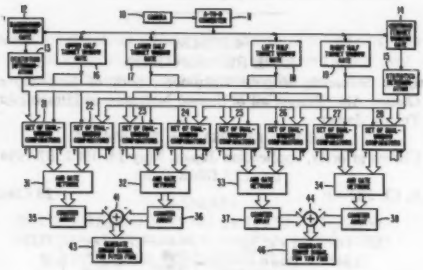
sampling pixels of possible target or background information;

sampling pixels known to be, at least in predominant part, background information;

establishing an average of the video signal intensities associated with said pixels known to be at least in predominant part background information;

comparing each of said pixels known to be at least in predominant part background information, to the established average of their video signal intensities, for separating those of said pixels having video signal intensities greater than average from those of said pixels having video signal intensities less than average;

accumulating statistics concerning said pixels known to be at least in predominant part background information having intensities greater than average and establishing from these statistics, without recourse to statistics concerning



the intensities of target information, a range of normally expected intensities associated with high-intensity background information pixels;

accumulating statistics concerning said pixels known to be at least in predominant part background information having intensities less than average and establishing from these statistics, without recourse to statistics concerning the intensities of target information, a range of normally expected intensities associated with low-intensity background information pixels; and

determining whether each of said pixels of possible target or background information falls outside both said ranges of normally expected intensities associated with background information pixels to establish a likelihood of its sampling target information rather than background information.

4,550,436

PARALLEL TEXT MATCHING METHODS AND APPARATUS

Martin Freeman, Palo Alto, Calif., and Leon S. Levy, Morristown, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 26, 1983, Ser. No. 517,330
Int. Cl.⁴ G06K *9/64*
U.S. Cl. 382—34 **11 Claims**

1. Apparatus for matching signals representing a line of printed alphanumeric characters with a given pattern of test signals representing a canonical string of printed characters comprising

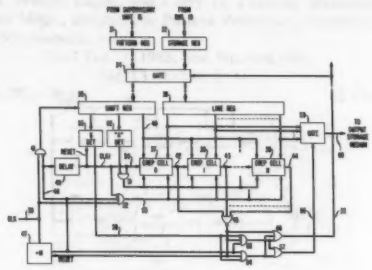
means for storing said line of character representing signals,

means for storing said pattern of test signals,

a plurality of alphanumeric character recognition cells equal in number to the number of said characters in said line,

means for applying each one of said character signals from said line to a respective one of said cells,

means for sequentially applying each of said pattern test signals to all of said cells, and



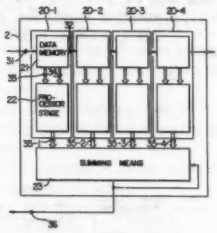
means for detecting the sequential matching to said pattern test signals in successive ones of said cells.

4,550,437

APPARATUS FOR PARALLEL PROCESSING OF LOCAL IMAGE DATA

Yoshiki Kobayashi, and Tadashi Fukushima, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 17, 1982, Ser. No. 389,498
Claims priority, application Japan, Jun. 19, 1981, 56-94048
Int. Cl.⁴ G06K *9/00;* **G06F** *15/20*
U.S. Cl. 382—41 **13 Claims**



1. An apparatus for parallel processing of m rows by n columns (m, n: integers) of local image data from an image data source, comprising:

means for receving said columns of local image data sequentially as series transmitted data;

a plurality of data memories each having m weight data stored therein and each serving to store the m local image data from a respective one of said n columns serially introduced via said receiving means;

a plurality of processor stages each including a multiplier and being provided one for each of said data memories for producing the products of each of said m image data with all of said m weight data in successive operations, said data memories and the corresponding processor stages constituting respective processor units connected in cascade;

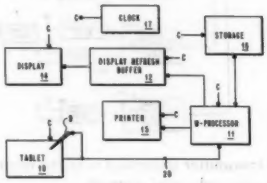
means for sequentially shifting said serially introduced image data between adjacent ones of said processor units to provide said sequential image data to be processed successively to said multipliers so that said products of said m image data with different ones of said m weight data are simultaneously produced from all of said processor units each time a shift of said image data is effected; and

means for summing the outputs of said multipliers in said processor stages.

4,550,438
RETRO-STROKE COMPRESSION AND IMAGE GENERATION OF SCRIPT AND GRAPHIC DATA EMPLOYING AN INFORMATION PROCESSING SYSTEM

Danny B. Convis, Washington Grove; Paul J. Grimm, Clarksburg, and Martin A. Reed, Rockville, all of Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1982, Ser. No. 393,281
Int. Cl.[4] G06K *9/48*
U.S. Cl. 382—56 5 Claims



1. A method for storing a representation of graphic input data from a computer tablet utilizing a digital computer system comprising the steps of:

(a) storing the x and y coordinates of the point at which the stylus of said computer tablet initially contacts said tablet;

(b) temporarily buffering the x and y coordinates of each subsequent point as the stylus moves across the tables until a reversal in stylus direction is detected along either an x or y axis;

(c) storing the x and y coordinates of the point at which the stylus reverses directions;

(d) generating a circular arc segment approximating the stylus path between the initial contact point and the point of reversal of stylus direction;

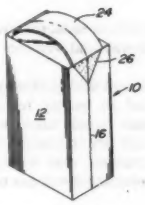
(e) storing the horizontal component of the mid-point of the circular arc segment; and

(f) repeating steps (a) through (e) for each additional movement of the stylus.

4,550,439
PLASTIC BAG WITH CARRYING HANDLE

Harry R. Peppiatt, Doylestown, and John S. Thomas, Langhorne, both of Pa., assignors to Paramount Packaging Corporation, Chalfont, Pa.

Filed May 20, 1983, Ser. No. 496,359
Int. Cl.[4] B65D *30/00*
U.S. Cl. 383—8 10 Claims

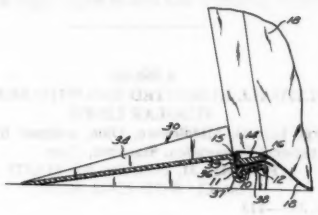


1. A polymeric plastic bag having a front panel joined along side edges to a rear panel, an opening at one end of said panels and a gusset joining the opposite ends of said panels, a handle in said gusset, said handle having two layers joined along a fold line, the free edges of the handle being adjacent the outer extremity of the gusset, each end of said handle being welded to each of said panels by a shaped weld having an apex corresponding generally to the location of the fold line on said handle.

4,550,440
ARTICLE RECEPTACLE

Ezequiel Rico, 1409 Florida Pl., Anaheim, Calif. 92805

Division of Ser. No. 170,188, Jul. 18, 1980, Pat. No. 4,411,300.
This application Aug. 15, 1983, Ser. No. 523,342
Int. Cl.[4] B65D *33/14*
U.S. Cl. 383—33 7 Claims



1. An article receptacle, comprising:

an inner frame, having an opening for receiving the mouth of a flexible bag, said inner frame having a top leg and a side leg;

an outer frame, independent of said inner frame, said outer frame having a top leg and a side leg, said inner and outer frames being formed to nest together to permit said inner frame to be freely and easily removed from said outer frame by lifting said inner frame out of said outer frame, and permit said inner and outer frames to frictionally engage said bag therebetween by lowering said inner frame into said outer frame; and

a scoop attachment, independent of said frames, comprising:

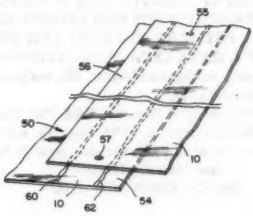
a ramp;

a bracket, attached to said ramp, for holding said frames, said bracket including (1) a channel for receiving the top leg of said outer frame, (2) a flange for supporting the side leg of said outer frame, and (3) a shoulder for supporting the top leg of said inner frame, said channel, said flange, and said shoulder cooperating to engage said frame to retain said frames a free standing position on said scoop attachment with said inner and outer frames nested together.

4,550,441
VENTED BAG

Stephen C. Keppel, Ridgefield, Conn., assignor to St. Regis Paper Company, West Nyack, N.Y.

Filed Jul. 18, 1984, Ser. No. 632,404
Int. Cl.[4] B65D *33/01*
U.S. Cl. 383—103 7 Claims



1. A commodity bag comprising a sealed plastic tube having a longitudinal seam formed by overlapping tube margins sealed by two spaced seals and forming an unobstructed channel between the margins, the overlapping margins being formed with openings only at opposite ends of the channel, one of the openings being formed in one of the overlapping tube margins at one end of the channel and providing communication be-

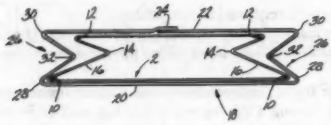
tween the interior of the tube and the channel to permit escape of air from the tube, another of the openings being formed in the other overlapping tube margin at the opposite end of the channel and providing communication between the interior of the channel and the exterior of the tube, the size and number of openings being such as to permit venting of the tube while inhibiting flow of commodity into the channel or admission of external contaminants into the channel.

4,550,442

MULTIWALL GUSSETTED BAG WITH SEAMLESS TUBULAR LINER

J. George Lepisto, Middletown, Ohio, assignor to Champion International Corporation, Stamford, Conn.

Filed May 31, 1984, Ser. No. 615,573
Int. Cl.[4] B65D *33/02, 30/20*
U.S. Cl. 383—113 **5 Claims**



2. A multiwall gussetted bag having a tubular plastic liner and at least one outer layer covering said plastic liner, said outer layer comprising front and back walls interconnected by gussetted side walls, each of said gussetted side walls including a pair of coexistent outwardly directed pleats and an intermediate inwardly directed pleat, and said liner having first and second walls adhesively secured to said front and back walls respectively of said outer layer, said first and second walls being interconnected by gussetted side walls, each of said gussetted side walls of said liner including a pair of marginal outwardly directed pleats and an intermediate inwardly directed pleat, one of said outwardly directed liner pleats being nested within a corresponding one of said outwardly directed outer layer pleats, and the other of said outwardly directed liner pleats being inwardly offset from and in nonnesting relationship with the other of said outwardly directed outer layer pleats.

4,550,443

METHOD AND APPARATUS FOR DYNAMICALLY SELECTING TRANSMITTERS FOR COMMUNICATIONS BETWEEN A PRIMARY STATION AND REMOTE STATIONS OF A DATA COMMUNICATIONS SYSTEM

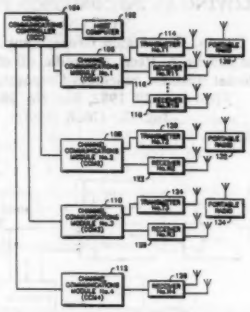
Thomas A. Freeburg, Arlington Heights, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 441,327, Nov. 12, 1982, Pat. No. 4,481,670. This application Sep. 24, 1984, Ser. No. 653,261
The portion of the term of this patent subsequent to Nov. 6, 2001, has been disclaimed.
Int. Cl.[4] H04B *1/00, 7/00*
U.S. Cl. 455—33 **2 Claims**

1. A method for selecting a transmitter for communicating a message signal from a host computer to a data radio in a data communications system covering a geographical area divided into zones, said host computer coupled to a plurality of receiver and transmitters, each transmitter associated with at least one receiver and covering at least one zone, said method comprising the steps of:

measuring the signal strength of the signal received by each receiver during each transmission from said data radio;

adjusting the measured signal strength for each receiver by a predetermined factor associated with that receiver; and



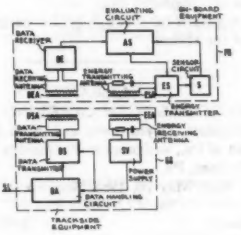
selecting the transmitter associated with the receiver having the largest adjusted signal strength.

4,550,444

FACILITY FOR INTERMITTENT TRANSMISSION OF INFORMATION BETWEEN GUIDEWAY WAYSIDE EQUIPMENT AND VEHICLES MOVING ALONG THE GUIDEWAY

Helmut Uebel, Leonberg, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 311,212, Oct. 14, 1981, abandoned. This application Oct. 19, 1983, Ser. No. 543,562
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1980, 3040137
Int. Cl.[4] H04B *5/00, 1/59*
U.S. Cl. 455—41 **7 Claims**



2. A facility for intermittent inductive transmission of information between a guideway and vehicles moving along said guideway, comprising:

a wayside portion adjacent said guideway including a binary data transmitter and an energy receiver having a first single series resonant circuit tuned to a first frequency coupled thereto, said first resonant circuit including an energy receiving antenna, said wayside portion further including a data transmitting antenna coupled to said data transmitter; and

a vehicle carried portion including a binary data receiver to receive data from said data transmitter on only a single predetermined frequency modulated channel, said data being in serial binary form frequency modulated on said predetermined frequency modulated channel, said predetermined channel having a second frequency different than said first frequency representing a binary "1" and a third frequency spaced from said first and second frequencies representing a binary "0" to convey said data therein, said vehicle-carried portion further including an energy transmitter having a second single series resonant circuit

tuned to said first frequency coupled thereto, said second resonant circuit including an energy transmitting antenna to transmit energy to said energy receiving antenna when said vehicle-carried portion approaches said wayside portion, said data transmitter transmitting said data to said data receiver when the distance between said two portions becomes smaller than a predetermined critical distance, said energy received by said energy receiving antenna being used at least in part to power said data transmitter, said vehicle-carried portion further including a data receiving antenna coupled to said data receiver, said data transmitting antenna and said energy transmitting antenna each being a ferrite-rod antenna disposed at right angles to one another, said data receiving antenna being a ferrite-rod antenna and said energy transmitting antenna being disposed at right angles to said data receiving antenna.

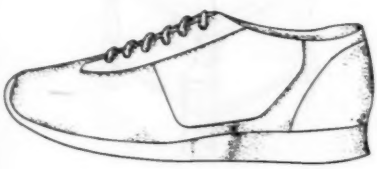
DESIGNS

OCTOBER 29, 1985

281,115
SPORT SHOE
Robert B. Campbell, New York, N.Y., and Junichi P. Landau, Taipei, Taiwan, assignors to BBC International, Ltd., New York, N.Y.
Filed Feb. 8, 1983, Ser. No. 464,878
Term of patent 14 years
U.S. Cl. D2—309

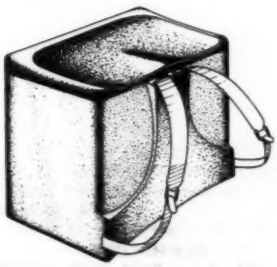
281,116
POCKETED ATHLETIC SHOE UPPER
Robert J. Gamm, St. Louis County, Mo., assignor to Kangaroos, St. Louis, Mo.
Continuation-in-part of Ser. No. 107,093, Dec. 26, 1979, Pat. No. Des. 261,823, and a continuation-in-part of Ser. No. 116,279, Jan. 28, 1980, Pat. No. Des. 261,695. This application Oct. 23, 1981, Ser. No. 314,136
Term of patent 14 years
U.S. Cl. D2—309

281,117
ATHLETIC SHOE WITH POCKET COVER FLAP
Robert J. Gamm, St. Louis County, Mo., assignor to Envoys U.S.A. Inc., St. Louis, Mo.
Continuation-in-part of Ser. No. 107,093, Dec. 26, 1979, Pat. No. Des. 261,823. This application Aug. 28, 1981, Ser. No. 297,337
Term of patent 14 years
U.S. Cl. D2—309

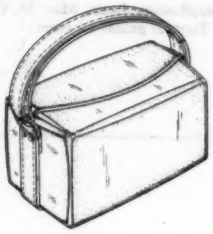


281,118
STITCH HOLDER
Yoshiaki Gakiya, Habikino, Japan, assignor to Clover Manufacturing Co., Ltd., Osaka, Japan
Filed May 3, 1983, Ser. No. 491,232
Claims priority, application Japan, Mar. 25, 1983, 58-12502
Term of patent 14 years
U.S. Cl. D3—26

281,119
BACKPACK COOLER WITH MOULDED BACK FRAME AND SEAT
Mark P. Kalkus, 49 Showers N261, Mt. View, Calif. 94043
Filed Jun. 13, 1983, Ser. No. 503,764
Term of patent 14 years
U.S. Cl. D3—32

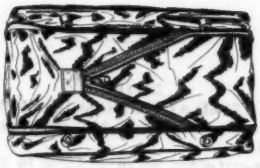


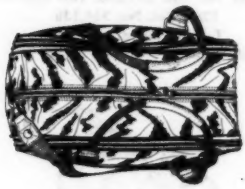
281,120
TOTE BAG WITH DOUBLE STRAP
Harold Rabinowitz, Midlothian, Va., assignor to Nappe Babcock Co., Richmond, Va.
Filed Jun. 8, 1983, Ser. No. 502,158
Term of patent 14 years
U.S. Cl. D3—42



281,121
KEY HOLDER
Stephen E. Cunliffe, Solana Beach, Calif., assignor to Ocean Trends, San Diego, Calif.
Filed Jun. 7, 1982, Ser. No. 314,216
Term of patent 14 years
U.S. Cl. D3—62

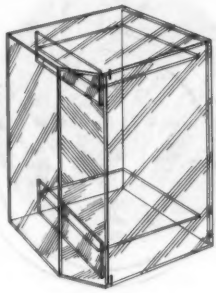
281,122
SOFT-SIDED LUGGAGE
Harvey Bomes, Wellesley Hills; John Pulichino, Wellesley; Jack Barber, Cambridge, all of Mass., and John Migliore, Barrington, R.I., assignors to American Tourister, Inc., Warren, R.I.
Filed Sep. 21, 1983, Ser. No. 534,282
Term of patent 14 years
U.S. Cl. D3—71



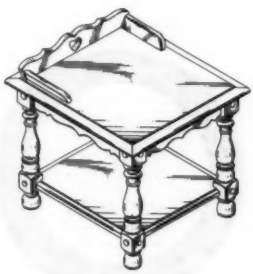


281,123
CLEANING DEVICE
John R. Frassanito, San Antonio, Tex., assignor to Sani-Fresh International, Inc., San Antonio, Tex.
Filed Apr. 14, 1983, Ser. No. 484,833
Term of patent 14 years
U.S. Cl. D4—114

281,124
PHOTOGRAPHIC ALBUM STORAGE AND DISPLAY CASE
Sasson Rejwan, North Woodmere, N.Y., assignor to Berkey Photo, Inc., White Plains, N.Y.
Filed Jul. 8, 1983, Ser. No. 512,040
Term of patent 14 years
U.S. Cl. D6—470



281,125
TABLE
Richard G. Brown, High Point, N.C., assignor to Null Manufacturing Corporation, Maiden, N.C.
Filed Sep. 29, 1982, Ser. No. 427,451
Term of patent 14 years
U.S. Cl. D6—477



281,126
PLATE OR SIMILAR ARTICLE
Simone Colquitt, New York, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Apr. 18, 1983, Ser. No. 486,038
Term of patent 14 years
U.S. Cl. D7—32

281,127
PLATE OR SIMILAR ARTICLE
Steve A. Unger, Manilus, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Mar. 23, 1983, Ser. No. 478,086
Term of patent 14 years
U.S. Cl. D7—33

281,128
PLATE OR SIMILAR ARTICLE
Steve A. Unger, Manilus, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Mar. 24, 1983, Ser. No. 478,636
Term of patent 14 years
U.S. Cl. D7—33

281,129
PLATE OR SIMILAR ARTICLE
Simone Colquitt, New York, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Apr. 18, 1983, Ser. No. 486,040
Term of patent 14 years
U.S. Cl. D7—33

281,130
PLATE OR SIMILAR ARTICLE
Steve A. Unger, Manilus, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Mar. 23, 1983, Ser. No. 478,088
Term of patent 14 years
U.S. Cl. D7—36

281,131
PLATE OR SIMILAR ARTICLE
Steve A. Unger, Manilus, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Mar. 24, 1983, Ser. No. 478,635
Term of patent 14 years
U.S. Cl. D7—36

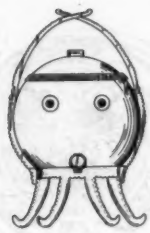
281,132
DECAL FOR A PLATE OR SIMILAR ARTICLE
Steve A. Unger, Manilus, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Mar. 23, 1983, Ser. No. 478,090
Term of patent 14 years
U.S. Cl. D7—39

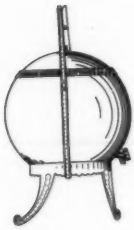
281,133
DECAL FOR A PLATE OR SIMILAR ARTICLE
Simone Colquitt, New York, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Apr. 18, 1983, Ser. No. 486,039
Term of patent 14 years
U.S. Cl. D7—39

281,134
DECAL FOR A PLATE OR SIMILAR ARTICLE
Simone Colquitt, New York, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Apr. 18, 1983, Ser. No. 486,041
Term of patent 14 years
U.S. Cl. D7—39

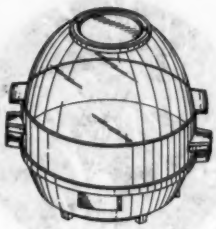
281,135
SPOON
Vivienne D. Jagger, Perth, Australia, assignor to Little People Limited, Hong Kong, Hong Kong
Filed Nov. 26, 1982, Ser. No. 444,848
Claims priority, application United Kingdom, Jun. 1, 1982, 1 007 031
Term of patent 14 years
U.S. Cl. D7—150

281,136
BEVERAGE DISPENSER OR THE LIKE
Yung-Kuan Wei, No. 196 Yen Tien Li An Nan District, Tainan, Taiwan
Filed Mar. 15, 1983, Ser. No. 475,558
Term of patent 14 years
U.S. Cl. D7—301



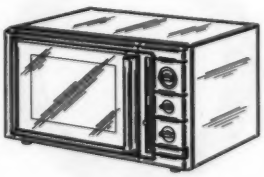


281,137
APPARATUS FOR POPPING CORN
William C. Cesaroni, Glenview, Ill., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Jan. 14, 1983, Ser. No. 458,089
Term of patent 14 years
U.S. Cl. D7—325



281,138
MICROWAVE OVEN
Hiroshi Fujii; Hiroshi Moritani; Wataru Iwahashi, and Masakazu Sugiyama, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Nov. 15, 1983, Ser. No. 552,166
Term of patent 14 years
U.S. Cl. D7—351

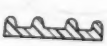
281,139
MICROWAVE OVEN
Hiroshi Fujii; Hiroshi Moritani; Masakazu Sugiyama, and Wataru Iwahashi, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Nov. 29, 1983, Ser. No. 555,956
Term of patent 14 years
U.S. Cl. D7—351



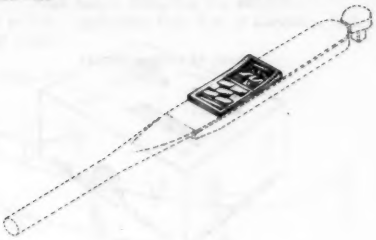
281,140
TOOL FOR ADJUSTING BICYCLE BRAKES
Brian Scura, Garden Grove, Calif., assignor to Scura Speed & Tech, Incorporated, Garden Grove, Calif.
Filed Jan. 17, 1983, Ser. No. 458,207
Term of patent 14 years
U.S. Cl. D8—71

281,141
RECORD ALBUM OPENER
Craig R. Butler, and Ede Scott, both of 9454 Wilshire Blvd., Beverly Hills, Calif. 90212
Filed Sep. 21, 1979, Ser. No. 63,358
The portion of the term of this patent subsequent to Nov. 29, 1997, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—98

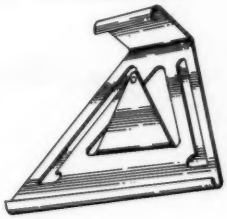
281,142
PICTURE FRAME BOWED CLIP
Robert S. Wallace, 823 S. Longwood Ave., Los Angeles, Calif. 90005
Filed Mar. 28, 1983, Ser. No. 479,370
Term of patent 14 years
U.S. Cl. D8—349



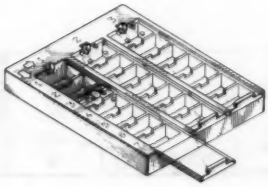
281,143
READOUT UNIT FOR TORQUE TOOLS
Bosko Grabovac, 19220 San Jose Ave., City of Industry, Calif. 91748
Filed Dec. 13, 1982, Ser. No. 449,473
Term of patent 14 years
U.S. Cl. D8—24



281,144
PICTURE FRAME HANGER
Pietro Astolfi, Bologna, Italy, assignor to Pico-Glass S.p.A., Italy
Filed May 16, 1983, Ser. No. 494,655
Claims priority, application Italy, Feb. 11, 1983, 4747/83[U]
Term of patent 14 years
U.S. Cl. D8—373

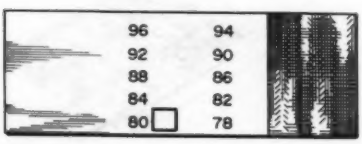


281,145
PILLBOX
Kjell Moe, Stockbyvägen 3A, Stocksund, Sweden
Filed Apr. 11, 1983, Ser. No. 484,146
Term of patent 14 years
U.S. Cl. D9—341

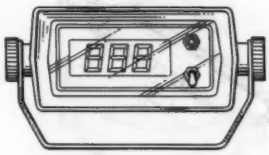


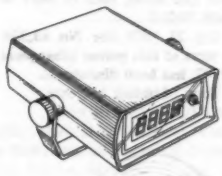
281,146
PACKAGING CONTAINER FOR DENTAL MATERIALS
Robert D. Holewinski, Lakehurst, N.J., assignor to J&J Dental Products Company, East Windsor, N.J.
Filed Mar. 9, 1983, Ser. No. 473,844
Term of patent 14 years
U.S. Cl. D9—345

281,147
THERMOCHROMIC FINGER THERMOMETER
Kailash C. Khemka, Indianapolis, Ind., assignor to Bio-Temp Products, Inc., Indianapolis, Ind.
Continuation-in-part of Ser. No. 140,458, Apr. 17, 1980, Pat. No. Des. 265,724. This application Jul. 29, 1982, Ser. No. 402,911
The portion of the term of this patent subsequent to Aug. 10, 1996, has been disclaimed.
Term of patent 14 years
U.S. Cl. D10—57

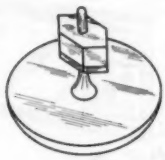


281,148
DIGITAL DEPTH METER
Rebecca A. Highstreet, Azusa; Raymond G. Shield, West Covina, and Nancy A. Jensen, Pasadena, all of Calif., assignors to Signet Scientific Co., El Monte, Calif.
Filed Apr. 25, 1983, Ser. No. 488,122
Term of patent 14 years
U.S. Cl. D10—70

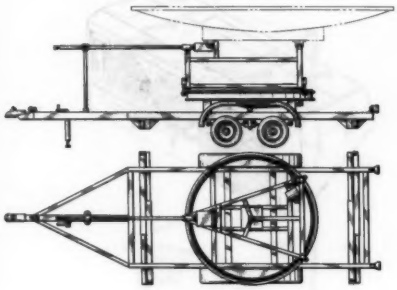




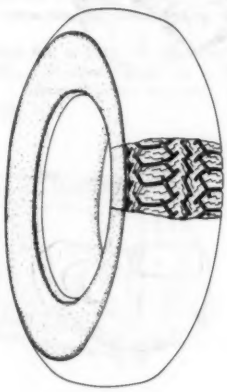
281,149
EARRING
Keil Krogh, Hvidovre, Denmark, assignor to Clenod A/S, Rodovre, Denmark
Filed Mar. 31, 1983, Ser. No. 480,870
Claims priority, application Denmark, Dec. 14, 1982, 1184/82
Term of patent 14 years
U.S. Cl. D11—41



281,150
MOBILE ANTENNA TRANSPORT TRAILER
Doyle Catlett, Roseville, Calif., assignor to Starsearch, Ltd., Englewood, Colo.
Filed Dec. 14, 1981, Ser. No. 330,445
Term of patent 14 years
U.S. Cl. D12—101

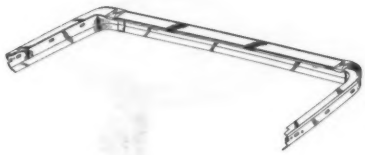


281,151
TIRE
Dionysius J. Poque, and Norbert Zinnen, both of Aachen, Fed. Rep. of Germany, assignors to Uniroyal Englebert Reifen GmbH, Aachen, Fed. Rep. of Germany
Filed Jul. 1, 1983, Ser. No. 510,363
Claims priority, application Fed. Rep. of Germany, Jan. 6, 1983, 73 MR 3309
Term of patent 14 years
U.S. Cl. D12—147

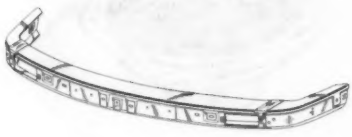


281,152
ELASTOMER BUMPER CORNER GUARD FOR AUTOMOBILE
Claus Luthe, Munich, and Boyke Boyer, Seefeld, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Apr. 8, 1983, Ser. No. 483,389
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1982, MR 13163
Term of patent 14 years
U.S. Cl. D12—167

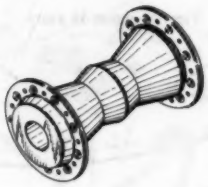
281,153
REAR BUMPER FOR AUTOMOBILE
Claus Luthe, Munich, and Boyke Boyer, Seefeld, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Apr. 8, 1983, Ser. No. 483,390
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1982, MR 13163
Term of patent 14 years
U.S. Cl. D12—169



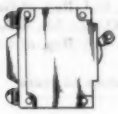
281,154
FRONT BUMPER FOR AUTOMOBILE
Claus Luthe, Munich, and Boyke Boyer, Seefeld, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Apr. 8, 1983, Ser. No. 483,423
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1982, MR 13163
Term of patent 14 years
U.S. Cl. D12—169



281,155
BICYCLE HUB
Brian Scura, Garden Grove, Calif., assignor to Scura Speed & Tech, Incorporated, Garden Grove, Calif.
Filed Jun. 6, 1983, Ser. No. 501,691
Term of patent 14 years
U.S. Cl. D12—207

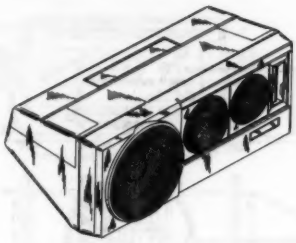


281,156
CIRCUIT BREAKER
George S. Harper, Cambridge, Md., assignor to Airpax Corporation, Cambridge, Md.
Filed Apr. 20, 1983, Ser. No. 486,450
Term of patent 14 years
U.S. Cl. D13—34

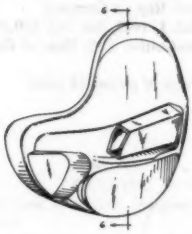


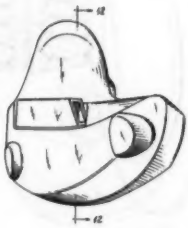
281,157
LOUDSPEAKER
You Takagi, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Jun. 29, 1983, Ser. No. 509,074
Claims priority, application Japan, Jan. 7, 1983, 58-135
Term of patent 14 years
U.S. Cl. D14—30

281,158
LOUDSPEAKER
Hidenki Ishizaki, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed May 25, 1983, Ser. No. 497,937
Claims priority, application Japan, Nov. 30, 1982, 57-53801
Term of patent 14 years
U.S. Cl. D14—34

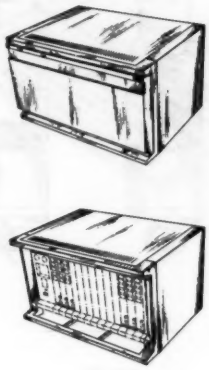


281,159
SOUND-ATTENUATING EARCUPS
Philip H. Stevens, Skaneateles, N.Y., assignor to Gentex Corporation, Carbondale, Pa.
Filed May 12, 1983, Ser. No. 494,067
Term of patent 14 years
U.S. Cl. D14—37

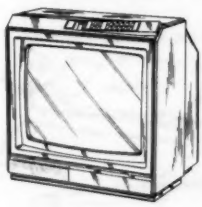




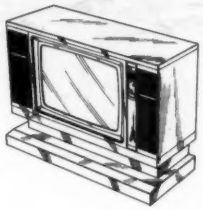
281,160
COMMUNICATION APPARATUS ENCLOSURE
Eric P. P. Chan, New York, N.Y.; Ronny N. Galloway, Hazlet, N.J.; Chris G. Johnson, New York, and Gordon E. Sylvester, Jamaica, both of N.Y., assignors to AT&T Information Systems, Holmdel, N.J.
Filed Aug. 6, 1984, Ser. No. 638,120
Term of patent 14 years
U.S. Cl. D14—52



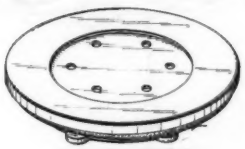
281,161
TELEVISION RECEIVER
Toyoyuki Uematsu, Osaka; Yoshiaki Kawata; Kazunori Mano, both of Hyogo, and Hiroyuki Tsubaki, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jun. 6, 1983, Ser. No. 501,727
Claims priority, application Japan, Dec. 9, 1982, 57-55461
Term of patent 14 years
U.S. Cl. D14—80



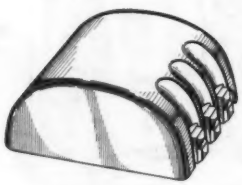
281,162
TELEVISION RECEIVER
Akira Takahashi, Sayama; Fumitaka Itou, Kawasaki; Toru Kiyota, Tachikawa; Takashi Fujii, Hino, and Mitsuo Kawaguchi, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jun. 15, 1983, Ser. No. 504,494
Claims priority, application Japan, Dec. 20, 1982, 57-56688
Term of patent 14 years
U.S. Cl. D14—82



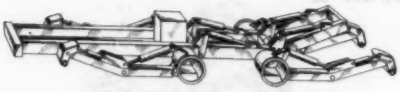
281,163
FILTER FOR A COMPUTER DISK DRIVE ASSEMBLY
Edgar A. Robinson, Bloomington, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.
Filed Sep. 20, 1982, Ser. No. 420,397
Term of patent 14 years
U.S. Cl. D14—109



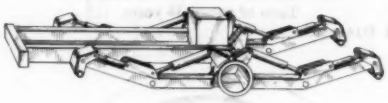
281,164
MOUSE
Syng N. Kim, Hoffman Estates, Ill., assignor to Wico Corporation, Niles, Ill.
Filed Apr. 25, 1983, Ser. No. 487,915
Term of patent 14 years
U.S. Cl. D14—114



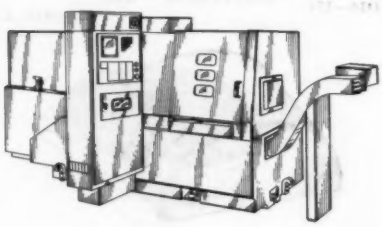
281,165
STEPPER CHASSIS FOR TERRAIN-GOING VEHICLES
Thor F. Braathen, N-3358 N. Eggedal, Norway
Filed Mar. 16, 1983, Ser. No. 475,752
Claims priority, application Netherlands, Sep. 17, 1982, 63266
Term of patent 14 years
U.S. Cl. D15—33



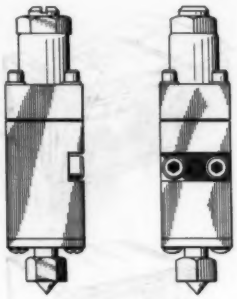
281,166
STEPPER CHASSIS FOR TERRAIN GOING VEHICLES
Thor F. Braathen, N-3358 N., Eggedal, Norway
Filed Mar. 16, 1983, Ser. No. 475,753
Claims priority, application Norway, Sep. 17, 1982, 63 269
Term of patent 14 years
U.S. Cl. D15—33



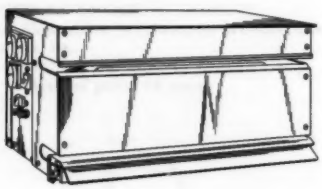
281,167
TURNING MACHINE
Carl J. Myers, Mentor, and Rainer B. Teufel, Columbus, both of Ohio, assignors to The Warner & Swasey Company, Cleveland, Ohio
Filed Jan. 12, 1983, Ser. No. 457,333
Term of patent 14 years
U.S. Cl. D15—130



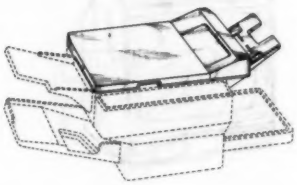
281,168
AUTOMATIC FLUID DISPENSER MODULE FOR HOT MELT ADHESIVE OR THE LIKE
Charles H. Scholl, Duluth, and Paul S. Frates, Lawrenceville, both of Ga., assignors to Nordson Corporation, Amherst, Ohio
Filed Jul. 14, 1982, Ser. No. 398,256
Term of patent 14 years
U.S. Cl. D15—144



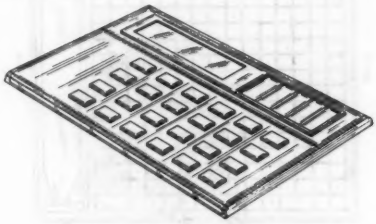
281,169
COMBINED ROLLER AND IMPULSE HEAT SEALING APPARATUS
Arthur R. Hillier, Knoxville, Tenn., assignor to DeRoyal Industries, Inc., Powell, Tenn.
Filed Jan. 27, 1983, Ser. No. 461,661
Term of patent 14 years
U.S. Cl. D15—146



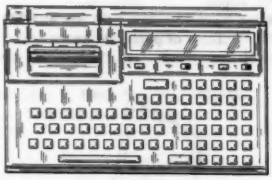
281,170
ORIGINAL FEEDER FOR COPYING MACHINE
Kunio Hara, Chiba, and Tooru Okuyama, Isehara, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Oct. 4, 1983, Ser. No. 539,002
Claims priority, application Japan, Apr. 7, 1983, 58-14329
Term of patent 14 years
U.S. Cl. D16—32



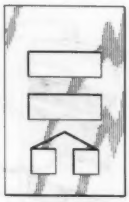
281,171
ELECTRONIC CALCULATOR
Masafumi Yamagami, and Keiji Sakata, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jun. 18, 1982, Ser. No. 389,959
Claims priority, application Japan, Dec. 26, 1981, 56-58614
Term of patent 14 years
U.S. Cl. D18—7



281,172
CALCULATOR
Isao Kitai, and Kazuo Yamada, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jan. 14, 1983, Ser. No. 457,962
Claims priority, application Japan, Jul. 15, 1982, 57-32170
Term of patent 14 years
U.S. Cl. D18—7



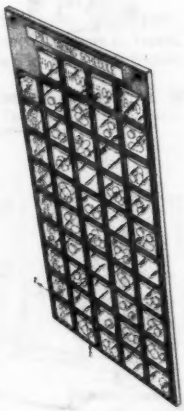
281,173
COLOR MATCHING CARD
David R. Bloom, 4010 25th Ave. South, Minneapolis, Minn. 55406
Filed Sep. 28, 1982, Ser. No. 425,572
Term of patent 14 years
U.S. Cl. D19—37



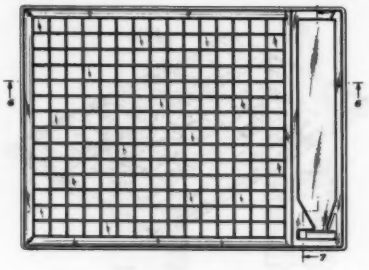
281,174
TETHERED PEN AND HOLDER THEREFOR
Richard F. Mahoney, 809 Pleasant St., and Kenneth L. Swartz, 149 Judson St., both of Raynham, Mass. 02767
Filed Mar. 10, 1983, Ser. No. 474,143
Term of patent 14 years
U.S. Cl. D19—75

281,175
SELF-SERVICE BETTING MACHINE
Neville A. Mitchell, Greystanes, Australia, assignor to ATL Pty. Limited, New South Wales, Australia
Filed Jan. 26, 1983, Ser. No. 461,144
Claims priority, application Australia, Jul. 29, 1982, 1083/82
Term of patent 14 years
U.S. Cl. D20—2

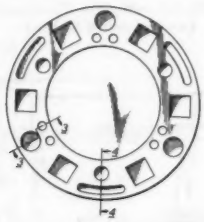
281,176
MONITOR BOARD FOR PILL-TAKING SCHEDULE
Suzanne B. Sukovich, 511 Ellis Pl., South Plainfield, N.J. 07080
Filed Dec. 8, 1983, Ser. No. 559,361
Term of patent 14 years
U.S. Cl. D20—18



281,177
GAME BOARD
Neil Tilbor, Great Neck, N.Y., assignor to CBS Inc., New York, N.Y.
Filed Apr. 4, 1983, Ser. No. 481,607
Term of patent 14 years
U.S. Cl. D21—17

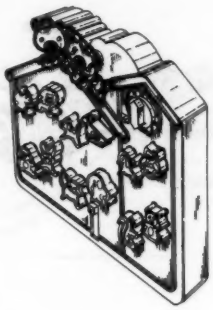


281,178
CARD TABLE
Joseph M. Brockenshire, 13 Bellevue Rd., Dromana, Victoria, Australia
Filed Jan. 13, 1983, Ser. No. 457,601
Claims priority, application Australia, Nov. 3, 1982, 2017/82
Term of patent 14 years
U.S. Cl. D21—37

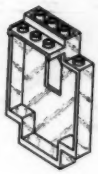


281,179
VIEWING TOY
Herbert C. Weiland, San Pedro, and Shinichi Kanaoki, Torrance, both of Calif., assignors to Tomy Kogyo Company, Incorporated, Japan
Filed May 12, 1983, Ser. No. 493,971
Term of patent 14 years
U.S. Cl. D21—59

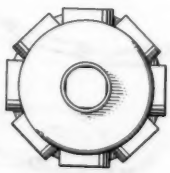
281,180
TOY PUZZLE
Cheuk S. Ng, Hong Kong, Hong Kong, assignor to Blue Box Toy Factory Pte. Ltd., Singapore
Filed Mar. 8, 1983, Ser. No. 473,503
Claims priority, application United Kingdom, Aug. 23, 1982, 1008394
Term of patent 14 years
U.S. Cl. D21—105



281,181
TOY CONSTRUCTION PIECE
Jens N. Knudsen, Billund, Denmark, assignor to Interleco A.G., Baar, Switzerland
Filed Dec. 10, 1982, Ser. No. 448,759
Term of patent 14 years
U.S. Cl. D21—108

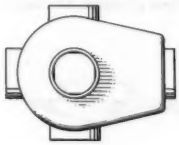


281,182
TOY CONSTRUCTION PIECE
Yuji Kato, Tokyo, Japan, and Michael W. Nuttall, So. Pasadena, Calif., assignors to Tomy Kogyo Company, Incorporated, Japan
Filed May 9, 1983, Ser. No. 492,619
Term of patent 14 years
U.S. Cl. D21—108

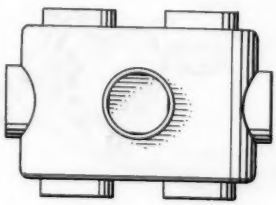


281,183
TOY CONSTRUCTION PIECE
Yuji Kato, Tokyo, Japan, and Michael W. Nuttall, So. Pasadena, Calif., assignors to Tomy Kogyo Company, Inc., Japan
Filed May 9, 1983, Ser. No. 492,620
Term of patent 14 years
U.S. Cl. D21—108

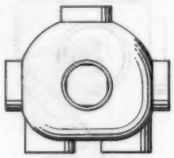
281,184
TOY CONSTRUCTION PIECE
Yuji Kato, Tokyo, Japan, and Michael W. Nuttall, So. Pasadena, Calif., assignors to Tomy Kogyo Company, Incorporated, Japan
Filed May 9, 1983, Ser. No. 492,621
Term of patent 14 years
U.S. Cl. D21—108



281,185
TOY CONSTRUCTION PIECE
Yuji Kato, Tokyo, Japan, and Michael W. Nuttall, So. Pasadena, Calif., assignors to Tomy Kogyo Company, Incorporated, Japan
Filed May 9, 1983, Ser. No. 492,622
Term of patent 14 years
U.S. Cl. D21—108

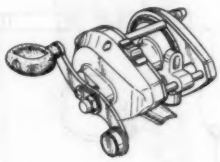


281,186
TOY CONSTRUCTION PIECE
Yuji Kato, Tokyo, Japan, and Michael W. Nuttall, So. Pasadena, Calif., assignors to Tomy Kogyo Company, Incorporated, Japan
Filed May 9, 1983, Ser. No. 492,625
Term of patent 14 years
U.S. Cl. D21—108

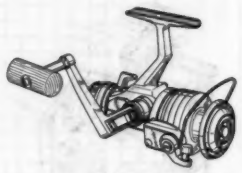


281,187
CLAMP ELEMENT FOR MODEL RAILROAD COUPLER
James A. Wiese, 1309 Mississippi Blvd., P.O. Box 737, Bettendorf, Iowa 52722
Filed Jun. 16, 1983, Ser. No. 505,129
Term of patent 14 years
U.S. Cl. D21—141

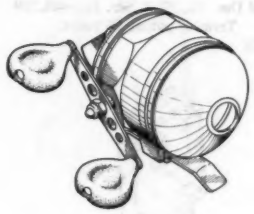
281,188
FISHING REEL
Takeshi Shohoji, Chiba, and Yutaka Kanamaru, Kanagawa, both of Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Feb. 17, 1983, Ser. No. 467,536
Claims priority, application Japan, Aug. 18, 1982, 57-37660
Term of patent 14 years
U.S. Cl. D22—25



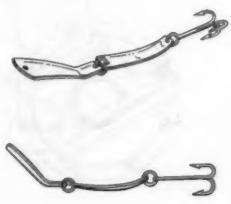
281,189
FISHING REEL
Etsuo Hiraishi, Hiroshima, and Takeshi Shohoji, Chiba, both of Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Feb. 17, 1983, Ser. No. 467,555
Claims priority, application Japan, Aug. 18, 1982, 57-37661
Term of patent 14 years
U.S. Cl. D22—25



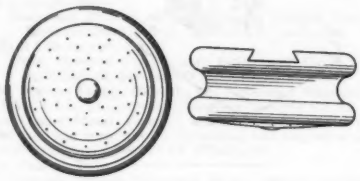
281,190
FISHING REEL
Keikichi Sakai, Tokyo, Japan, assignor to Sakai Co., Ltd., Tokyo, Japan
Filed Jul. 12, 1983, Ser. No. 513,099
Term of patent 14 years
U.S. Cl. D22—25



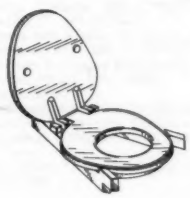
281,191
FISHING SPOON
Hubert J. Marx, Jr., 20827 Pearl, Farmington Hills, Mich. 48024
Filed Jun. 6, 1983, Ser. No. 501,513
Term of patent 14 years
U.S. Cl. D22—29



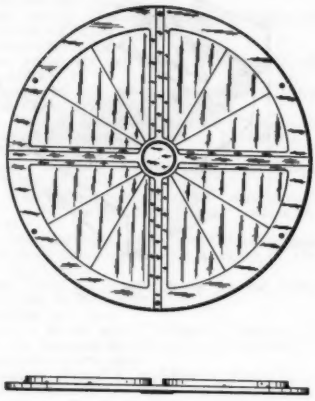
281,192
SHOWER HEAD
Carlo Santi, Milan, Italy, assignor to Rubinetterie Stella S.p.A., Milan, Italy
Filed Jul. 29, 1982, Ser. No. 403,170
Claims priority, application Italy, Feb. 19, 1982, 20908 B/82
Term of patent 14 years
U.S. Cl. D23—35



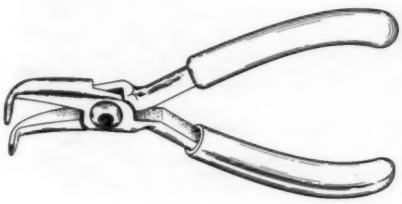
281,193
TOILET SEAT FOR INFANTS
Glen D. Chapman, 1150 New York St. #528, Long Beach, Calif. 90813
Filed Sep. 2, 1982, Ser. No. 414,573
Term of patent 14 years
U.S. Cl. D23—53



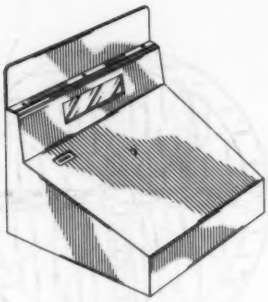
281,194
SELF-CLOSING VENTILATION LOUVER
Kert E. Artwick, Roswell, Ga., assignor to Leslie-Locke, Inc., Atlanta, Ga.
Filed Jan. 6, 1983, Ser. No. 456,305
Term of patent 14 years
U.S. Cl. D23—151



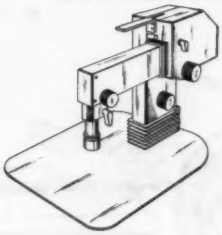
281,195
ORTHODONTIC UTILITY PLIER
Craven H. Kurz, 465 N. Roxbury Dr., #1011, Beverly Hills, Calif. 90210
Filed Sep. 29, 1982, Ser. No. 426,841
Term of patent 14 years
U.S. Cl. D24—10



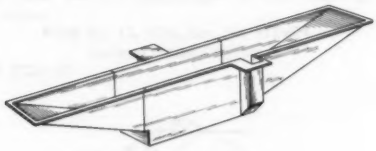
281,196
PULSE RATE MONITOR CONSOLE
Leland W. Knight, Tempe, Ariz., assignor to Omaco Enterprises, Inc., Phoenix, Ariz.
Filed Jun. 21, 1982, Ser. No. 390,222
Term of patent 14 years
U.S. Cl. D24—17



281,197
HEMOSTAT
Harvinder Sahota, 3861 Wisteria, Seal Beach, Calif. 90740
Filed Mar. 14, 1983, Ser. No. 475,249
Term of patent 14 years
U.S. Cl. D24—17



281,198
AQUATIC EXERCISE TANK
David L. Hansen, Rte. 2, Box 226, Maple Park, Ill. 60151
Filed Feb. 4, 1983, Ser. No. 463,860
Term of patent 14 years
U.S. Cl. D24—38



281,199
SAFETY STAND FOR USE IN ASSOCIATION WITH HYDRAULIC LIFT
William F. Prawl, 5636 Tahama St., Sacramento, Calif. 95841
Filed May 18, 1983, Ser. No. 495,864
Term of patent 14 years
U.S. Cl. D34—28

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF OCTOBER, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Nattermann & Cie GmbH: *See*—
Welter, Andre; Leyck, Sigurd; and Etschenberg, Eugen, 4,550,168, Cl. 546-270.000.

A.S. Kongsberg Vapenfabrikk: *See*—
Stroem, Sigmunn; and Mowill, Rolf J., 4,549,847, Cl. 415-182.000.

Ab Carbogel: *See*—
Mathiesen, Mait M.; Gillberg, Lars I.; Hellsten, Karl M. E.; and Karlsson, Gunvor B. T., 4,549,881, Cl. 44-51.000.

Abbott Laboratories: *See*—
Voss, Houston F.; Plattner, Jacob; and Herrin, Thomas R., 4,550,163, Cl. 544-244.000.

Abe, Michio; Maeda, Naoyuki; and Tokunaga, Shigemitsu, to Tokai TRW & Co., Ltd. Power steering device. 4,549,628, Cl. 180-143.000.

Abe, Osamu; Mouri, Yasunori; and Sugiura, Noboru, to Hitachi, Ltd. Method and apparatus for controlling knocking of an internal combustion engine. 4,549,514, Cl. 123-425.000.

Abe, Osamu: *See*—
Shimada, Shigeru; Kakumoto, Shigeru; and Abe, Osamu, 4,550,434, Cl. 382-9.000.

Abe, Ryozo: *See*—
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; and Yoshihara, Kenji, 4,550,393, Cl. 369-32.000.

Abe, Yuji: *See*—
Matsumoto, Seishi; Nakashimizu, Takeo; and Abe, Yuji, 4,549,617, Cl. 177-1.000.

Abend, Robert J.; and Shelton, C. Byron, Jr., to Harris Corporation. Method of fabricating an IC including electro-optical transmitters and receivers. 4,549,338, Cl. 29-569.00L.

Abitibi-Price Inc.: *See*—
Tay, Ching-Hua; and Fairchild, Raymond S., 4,549,929, Cl. 162-78.000.

Abrokwah, Jonathan K., to Honeywell Inc. Control of Si doping in GaAs, (Al,Ga)As and other compound semiconductors during MBE growth. 4,550,031, Cl. 427-10.000.

ACI Australia Limited: *See*—
Marshall, Stephen; and An, Hung D., 4,549,387, Cl. 53-469.000.

Adamowicz, John A.; Schlup, John R.; and Spotz, Mark S., to Corning Glass Works. Inorganic binders for articles formed from fibers. 4,549,931, Cl. 162-145.000.

Adolph Coors Company: *See*—
Jensen, James W., Jr., 4,549,917, Cl. 156-108.000.

Aeromarine Technology, Inc.: *See*—
Barba, Walter D., 4,549,910, Cl. 148-6.270.

Aeroquip Corporation: *See*—
Fournier, Paul J. E.; and Rogers, Russell L., 4,549,440, Cl. 73-863.850.
Rogers, Russell L., 4,549,575, Cl. 137-614.030.

Affa, Alfred; and Ernst, Alfons, to Dr. Johannes Heidenhain GmbH. Measuring system. 4,549,354, Cl. 33-125.00T.

Agence Nationale pour la Valorisation et la Recherche: *See*—
Foch, Henri; and Roux, Jacques, 4,550,365, Cl. 363-98.000.

Ahmer, Bruce E.: *See*—
Scott, William B.; and Ahmer, Bruce E., 4,550,241, Cl. 219-121.0LG.

Aichinger, Horst; Marhoff, Paul; and Pfeiler, Manfred, to Siemens Aktiengesellschaft. Diagnostic radiology setup with means for suppressing stray radiation. 4,550,419, Cl. 378-099.000.

Air Products and Chemicals, Inc.: *See*—
Bligh, Bernard R., 4,549,890, Cl. 62-18.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Kawakami, Toshiro, 4,549,821, Cl. 384-103.000.
Yogo, Kenji, 4,549,470, Cl. 92-94.000.

Aisin Warner Kabushiki Kaisha: *See*—
Sakakibara, Shiro, 4,549,447, Cl. 74-689.000.

Ajimine, Akio: *See*—
Yanagishima, Takayuki; Kasai, Junichi; Ajimine, Akio; Watanabe, Tatsuya; Shino, Akimitsu; and Murakami, Yoshiaki, 4,550,428, Cl. 381-86.000.

Ajinomoto Co., Inc.: *See*—
Takemoto, Tadashi; Hijiya, Toyoto; and Yamatani, Tetsuo, 4,550,180, Cl. 549-253.000.

Akashi, Mineo; and Kitada, Yoshitaka, to Nippon Electric Co., Ltd. Pulse generator. 4,550,307, Cl. 340-347.0DA.

Akashi, Tsutomu, to Nippon Electric Co., Ltd. Semiconductor memory device. 4,550,390, Cl. 365-174.000.

Akiba, Yosuke: *See*—
Ando, Hiroshi, 4,550,026, Cl. 426-316.000.

Akita, Shuichi; and Namizuka, Toshio, to Nippon Zeon Co. Ltd. Rubber composition. 4,550,142, Cl. 525-236.000.

Akzo NV: *See*—
Gerlach, Klaus; Lange, Wolfgang; and Loh, Dieter, 4,549,969, Cl. 210-759.000.
Gispen, Willem H., 4,550,099, Cl. 514-14.000.
Vrouenraets, Cornelius M. F., 4,550,025, Cl. 426-105.000.

Albany International Corp.: *See*—
Lopatin, George; Coplan, Myron J.; and Walton, James P., Jr., 4,550,123, Cl. 521-64.000.

Albers, Christopher J.: *See*—
Albers, Joseph H.; and Albers, Christopher J., 4,549,786, Cl. 350-625.000.

Albers, Joseph H.; and Albers, Christopher J. Mirror assembly. 4,549,786, Cl. 350-625.000.

Albertsen, Peter S.; and Miller, Thomas, to Nu-Tec Incorporated. Catalytic unit for burners. 4,549,524, Cl. 126-289.000.

Alberty, Michael: *See*—
Ehrlinger, Wolfgang; Hirsch, Gerhard; and Alberty, Michael, 4,550,296, Cl. 333-26.000.

Albrecht, Ernst; and Busch, Edgar, to Pfaff Industriemaschinen GmbH. Feed drive for a stitch group sewing machine. 4,549,491, Cl. 112-73.000.

Albrecht, Ernst; and Busch, Edgar, to Pfaff Industriemaschinen GmbH. Material clamp for sewing machines. 4,549,492, Cl. 112-76.000.

Albright, Jay D.: *See*—
Moran, Daniel B.; Powell, Dennis W.; and Albright, Jay D., 4,550,166, Cl. 546-119.000.

Alco Industries, Inc.: *See*—
Newell, S. David; Matko, William F.; Onoratti, James L.; and Parrott, Lawrence H., 4,549,337, Cl. 29-527.400.

Alcon Laboratories, Inc.: *See*—
Garabedian, Michael E.; and Roehrs, Robert E., 4,550,022, Cl. 424-127.000.

Alemanni, James C. Carrier for pin grid array. 4,549,651, Cl. 206-329.000.

Alexander, M. Grayson; and Riley, Brian, to Combustion Engineering, Inc. Solid electrolyte. 4,550,066, Cl. 429-191.000.

Alexander, Robert L.; Getoor, Richard C.; and Reinersman, Dennis J., to American Building Components Company. Chimney cap. 4,549,473, Cl. 98-67.000.

Algate Instrument Corp.: *See*—
Allen, Frank L., 4,549,360, Cl. 33-293.000.

Alinco Incorporated: *See*—
Inoue, Shunsaku, 4,549,632, Cl. 182-23.000.

Allen, Daniel E.: *See*—
Allen, Ross R.; and Allen, Daniel E., 4,550,326, Cl. 346-140.00R.

Allen, Frank L., to Algate Instrument Corp. Device for alignment of process equipment and method of use thereof. 4,549,360, Cl. 33-293.000.

Allen, Jerry R., to Pester Refining Company. Asphalt rejuvenating composition and process. 4,549,834, Cl. 404-75.000.

Allen, Ross R.; and Allen, Daniel E., to Hewlett-Packard Company. Fluidic tuning of impulse jet devices using passive orifices. 4,550,326, Cl. 346-140.00R.

Allied Corporation: *See*—
Bose, Debasis; Datta, Amitava; and DeCristofaro, Nicholas J., 4,549,687, Cl. 228-263.180.
Fanelli, Anthony J.; and Price, Alson K., 4,550,093, Cl. 502-107.000.
Fannin, Richard C., 4,549,888, Cl. 55-163.000.
Nelson, Larry A.; and Schmidt, Leon W., 4,550,084, Cl. 436-45.000.
Patel, Gordhanbhai N.; Preziosi, Anthony F.; Bhattacharjee, Himangshu R.; and Lee, Lester T. C., 4,550,150, Cl. 526-233.000.
Thomas, Rudy V., 4,549,749, Cl. 280-808.000.

Allied Tube & Conduit Corporation: *See*—
Basile, Raffaele, 4,549,756, Cl. 285-388.000.

Alpine Engineered Products, Inc.: *See*—
Birckhead, Robert W., 4,549,838, Cl. 411-468.000.

Alps Electric Co., Ltd.: *See*—
Kimura, Kiyoshi, 4,550,384, Cl. 364-556.000.

Altherr, Russell G.; and Schmitt, Steven F., to AMSTED Industries Incorporated. Railway vehicle draft sill and slackless draft assembly. 4,549,666, Cl. 213-62.00A.

Alticosalian, Girair H. Perfume dispenser. 4,549,674, Cl. 222-48.000.

Amano Seiyaku Kabushiki Kaisha: *See*—
Yamada, Hideaki; Otsuji, Shogo; Isobe, Kimiyasu; Matsunaga, Kuniyoshi; and Inukai, Tadahiko, 4,550,078, Cl. 435-25.000.

Ambike, Suhas H.; Grewal, Narinder S.; and Blaser, Eric, to Warner-Lambert Company. Dental hygiene compositions. 4,550,018, Cl. 424-52.000.

Ambrosius, William, III: *See*—
Chung, Randall; and Ambrosius, William, III, 4,550,391, Cl. 365-233.000.

American Building Components Company: *See*—
Alexander, Robert L.; Getoor, Richard C.; and Reinersman, Dennis J., 4,549,473, Cl. 98-67.000.

American Cyanamid Company: *See*—
Hlavka, Joseph J.; Bitha, Panayota; and Lin, Yang-I, 4,550,169, Cl. 548-108.000.
Moran, Daniel B.; Powell, Dennis W.; and Albright, Jay D., 4,550,166, Cl. 546-119.000.
American Hoechst Corporation: *See*—
Kelly, Michael G.; and Covill, James H., 4,550,189, Cl. 560-044.000.
Pampalone, Thomas R., 4,550,069, Cl. 430-165.000.
American Home Products Corporation: *See*—
Musser, John H.; and Tio, Cesario O., 4,550,172, Cl. 548-180.000.
American Maize-Products Company: *See*—
Samuel, Raj K.; Kozlowski, Ronald J.; and Pustek, Frank J., 4,549,909, Cl. 127-33.000.
American Seating Company: *See*—
Wilkerson, Larry A., 4,549,763, Cl. 297-183.000.
American Standard Inc.: *See*—
Bergmann, Konrad, 4,549,579, Cl. 137-625.210.
AMF Incorporated: *See*—
Angel, Bruce A., 4,549,576, Cl. 137-614.040.
Ammermann, Eberhard: *See*—
Ruland, Alfred; Reuther, Wolfgang; Pommer, Ernst-Heinrich; and Ammermann, Eberhard, 4,550,173, Cl. 548-262.000.
Amoco Corporation: *See*—
Hensley, Albert L., Jr.; and Quick, Leonard M.,. 4,549,957, Cl. 208-216.0PP.
AMP Incorporated: *See*—
Bertini, Carlo; and Bruni, Aldo, 4,549,780, Cl. 339-107.000.
Grubb, Daniel B.; and Hughes, Donald W. K., 4,549,343, Cl. 29-33.00M.
AMSTED Industries Incorporated: *See*—
Altherr, Russell G.; and Schmitt, Steven F., 4,549,666, Cl. 213-62.00A.
An, Hung D.: *See*—
Marshall, Stephen; and An, Hung D., 4,549,387, Cl. 53-469.000.
Ancel, Christian; and Philibert, Pierre, to Compagnie Generale des Etablissements Michelin. Compositions having a base of sulfur-vulcanizable rubber. 4,549,594, Cl. 152-359.000.
Anderka, Gerold; and Tenhagen, Rolf, to Rotring-Werke Riepe KG. Writing instrument with separable compensating means. 4,549,828, Cl. 401-258.000.
Andersen, David P.; Hedin, Raymond C.; and Siebenand, John F., to Sperry Corporation. Speech sampling and companding device. 4,550,425, Cl. 381-30.000.
Anderson, Clifford J.: *See*—
Bland, Linden; and Anderson, Clifford J., 4,549,432, Cl. 73-200.000.
Anderson, Gordon K.; and Savage, William S., to Carrier Corporation. Modular air conditioning unit for mobile cargo container. 4,549,405, Cl. 62-239.000.
Anderson, Kenneth: *See*—
Stonestreet, Paul R.; Williams, David; Anderson, Kenneth; and Butcher, Peter J. L., 4,550,411, Cl. 373-134.000.
Anderson, Lloyd L.; and Girard, Leon E., to Iowa State University Research Foundation, Inc. Animal head restrainer. 4,549,501, Cl. 119-99.000.
Anderson, Wayne K.; and Quagliato, Dominick A., to Research Foundation of State University of New York, The. Synthesis of platinum (IV) antineoplastic agents. 4,550,187, Cl. 556-137.000.
Andersson, Russell L., to AT&T Bell Laboratories. Image processor using a moment generator. 4,550,432, Cl. 382-1.000.
Andis Company: *See*—
Andis, Matthew L., 4,549,560, Cl. 132-37.00R.
Andis, Matthew L., to Andis Company. Hair curling appliance with elastomer material covering heating element. 4,549,560, Cl. 132-37.00R.
Ando, Hiroshi, to Akiba, Yosuke. Method for preserving food using a preservative gas atmosphere. 4,550,026, Cl. 426-316.000.
Ando, Takehiro; Miyake, Shuji; Murakami, Osamu; Kawabata, Takashi; Hayashi, Shigeo; Otonari, Michiyasu; and Kato, Toyoaki, to Hitachi Zosen Corporation. Docking apparatus for ships. 4,549,835, Cl. 405-4.000.
Andoh, Shizuo: *See*—
Yamaguchi, Hisashi; Asano, Toru; Takahara, Kazuhiro; Kurahashi, Keizo; and Andoh, Shizuo, 4,550,310, Cl. 340-365.00C.
Andrae, Klaus; and Hutschenreuter, Elfriede, to Hoechst Aktiengesellschaft. Shirred sausage casing and process for its manufacture. 4,550,042, Cl. 428-36.000.
Andrew, Colin: *See*—
Sexton, John S.; Stone, Brian J.; Howes, Trevor D.; and Andrew, Colin, 4,549,372, Cl. 51-206.00R.
Andrews, Robert S. L. Method of reclaiming foundry sand. 4,549,698, Cl. 241-17.000.
Andrione, Norbert; and Peruzzi, Federigo, to Aspera S.p.A. Suspension system for hermetic motor-compressors of refrigerators and the like. 4,549,859, Cl. 417-363.000.
Angel, Bruce A., to AMF Incorporated. Quick disconnect marine coupling system. 4,549,576, Cl. 137-614.040.
Angliker, Hans-Jorg: *See*—
Schmutz, Paul; and Angliker, Hans-Jorg, 4,549,989, Cl. 260-378.000.
Annen, Klaus: *See*—
Hofmeister, Helmut; Schulze, Paul E.; Annen, Klaus; Laurent, Henry; and Wiechert, Rudolf, 4,550,100, Cl. 514-179.000.
Ansbjer, Jan. Self-loading carriage for round bales. 4,549,840, Cl. 414-24.500.
Ansite, William K.: *See*—
Rosenberg, Isadore; and Ansite, William K., 4,550,044, Cl. 428-101.000.
ANT Nachrichtentechnik GmbH: *See*—
Ehrlinger, Wolfgang; Hirsch, Gerhard; and Alberty, Michael, 4,550,296, Cl. 333-26.000.
Anthony, Thomas R., to General Electric Company. Anode and cathode connections for the practice of electromigration. 4,549,912, Cl. 148-33.100.
Antonian, Semen G.: *See*—
Lavretskaya, Elionora F.; Rudzit, Ernest A.; Piruzian, Lev A.; Volkova, Ljubov I.; Zakharova, Nina I.; Sarkisian, David A.; Upadysheva, Alexandra V.; Grigorieva, Natalya D.; Znamenskaya, Anna P.; Libinzon, Rakhil E.; and Antonian, Semen G., 4,550,113, Cl. 514-290.000.
Aoki, Hirokazu: *See*—
Toyooka, Takashi; Yoshida, Kazutoshi; Ishida, Kazuhiro; Okahashi, Tatsuo; Aoki, Hirokazu; Suzuki, Ryo; and Sugita, Yutaka, 4,550,388, Cl. 365-6.000.
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizu, Susumu; Watanabe, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, to Kureha Kagaku Kogyo Kabushiki Kaisha. Salts of derivatives of N-(tetrahydrobenzothiazolylcarbamoyl)oxamic acid and herbicidal composition containing the same as active ingredient. 4,549,902, Cl. 71-90.000.
Aono, Toshiaki; and Nakamura, Koichi, to Fuji Photo Film. Co., Ltd. Heat development using acids. 4,550,071, Cl. 430-203.000.
Apogee Acoustics, Inc.: *See*—
Walker, Gary E.; Spiegel, Leo; Shuman, Anthony J.; and Kirtley, James L., Jr., 4,550,228, Cl. 179-115.00V.
Applegate, Barry G., to Molins plc. Feeding articles. 4,549,645, Cl. 198-408.000.
Appleton Papers, Inc.: *See*—
Goetz, William J.; and Engel, Thomas G., 4,549,932, Cl. 162-207.000.
Applied Power, Inc.: *See*—
Hense, Thomas R.; and Rudolph, Ronald M., 4,549,359, Cl. 33-516.000.
Arabori, Hideo: *See*—
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizu, Susumu; Watanabe, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,549,902, Cl. 71-90.000.
Arai, Mitsutaka: *See*—
Yamauchi, Yasuhisa; Asano, Masao; and Arai, Mitsutaka, 4,550,054, Cl. 428-328.000.
Arai, Ryuichi; and Toganoh, Shigeo, to Canon Kabushiki Kaisha. Recording medium. 4,550,053, Cl. 428-304.400.
Arai, Tetsuji; and Shimizu, Hiroshi, to Ushio Denki Kabushiki Kaisha. Light-radiant furnace for heating semiconductor wafers. 4,550,245, Cl. 219-405.000.
Araujo, Roger J.; Hares, George B.; Kerko, David J.; Morgan, David W.; and Morse, David L., to Corning Glass Works. Ultraviolet absorbing photochromic glass of low silver content. 4,549,894, Cl. 65-30.110.
Arkles, Barry C., to Petrarch Systems, Inc. Mixtures of polyacrylate resins and siloxane-styrene copolymers. 4,550,139, Cl. 525-90.000.
Armstrong, Raynor O.; Norrgran, Daniel A.; and Yuill, William A., to Atlantic Richfield Company. Process for separating molybdenite from a molybdenite-containing copper sulfide concentrate. 4,549,959, Cl. 209-167.000.
Asa S.A.: *See*—
Matas Gabalda, Carlos, 4,549,393, Cl. 57-58.360.
Asahi Kakoshi Co., Ltd.: *See*—
Nakagawa, Yasuyuki, 4,550,048, Cl. 428-138.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Hasegawa, Akio; and Kojima, Hiroshige, 4,550,080, Cl. 435-212.000.
Inoue, Tadashi; and Tanaka, Tetsuro, 4,549,947, Cl. 204-182.400.
Kataoka, Hiroshi, 4,550,057, Cl. 428-215.000.
Sakata, Norihiko; and Miura, Nobuo, 4,550,003, Cl. 264-53.000.
Asano, Masao: *See*—
Yamauchi, Yasuhisa; Asano, Masao; and Arai, Mitsutaka, 4,550,054, Cl. 428-328.000.
Asano, Toru: *See*—
Yamaguchi, Hisashi; Asano, Toru; Takahara, Kazuhiro; Kurahashi, Keizo; and Andoh, Shizuo, 4,550,310, Cl. 340-365.00C.
ASEA Aktiebolag: *See*—
Bachler, Sven, 4,550,299, Cl. 335-195.000.
Lassander, Erik; and Stenkvist, Sven E., 4,550,413, Cl. 373-108.000.
Ashland Oil, Inc.: *See*—
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Hettinger, William P., Jr.; Kovach, Stephen M.; Palmer, James L.; and Zandona, Oliver J., 4,549,958, Cl. 208-253.000.
Aspera S.p.A.: *See*—
Andrione, Norbert; and Peruzzi, Federigo, 4,549,859, Cl. 417-363.000.
Assens, Michel: *See*—
Auge, Jean; Lavaur, Jacques; and Assens, Michel, 4,549,358, Cl. 33-560.000.
AT&T Bell Laboratories: *See*—
Andersson, Russell L., 4,550,432, Cl. 382-1.000.
Berkstresser, George W.; Huo, Tai-Chan D.; and Shmulovich, Joseph, 4,550,256, Cl. 250-483.100.
Chemla, Daniel S., 4,549,788, Cl. 350-354.000.

Chodrow, Mark M.; Sander, Bernard T., Jr.; Sharpless, Charles H.; and Theriot, Eugene J., 4,550,404, Cl. 370-110.100.
Damen, Theodoor C.; Duguay, Michael A.; Howard, Richard E.; Jackel, Lawrence D.; and Skocpol, William J., 4,550,249, Cl. 250-201.000.
Debus, Walter, Jr., 4,550,415, Cl. 375-14.000.
Freeman, Martin; and Levy, Leon S., 4,550,436, Cl. 382-34.000.
Hoffmaster, Timothy D., 4,549,807, Cl. 356-318.000.
Miller, Stewart E., 4,549,782, Cl. 350-96.160.
Oh, Kye H., 4,549,914, Cl. 148-187.000.
Sooch, Navdeep S., 4,550,284, Cl. 323-315.000.
Spears, Danny R., 4,550,401, Cl. 370-85.000.
Turner, Jonathan S.; and Wyatt, Leonard F., 4,550,397, Cl. 370-60.000.
Tzinis, Costas H.; and Vadimsky, Richard G., 4,550,074, Cl. 430-322.000.
Winchell, David F., 4,550,224, Cl. 179-18.0BC.

Atanassov, Haralampi A.: *See*—
Makedonski, Boris G.; and Atanassov, Haralampi A., 4,549,370, Cl. 51-7.000.

Atlantic Richfield Company: *See*—
Armstrong, Raynor O.; Norrgran, Daniel A.; and Yuill, William A., 4,549,959, Cl. 209-167.000.

Atlas Copco Aktiebolag: *See*—
Verner, Bo L.; and Fors, Lars B. S., 4,549,997, Cl. 261-77.000.

Atobe, Takashi, to Daiwa Seiko, Inc. Device for preventing backlash on spool of fishing reel. 4,549,703, Cl. 242-84.52B.

Atsumi, Morihiro: *See*—
Yamaguchi, Shunzo; Atsumi, Morihiro; and Fukazawa, Takeshi, 4,549,905, Cl. 75-238.000.

Atwood, Edwards S.: *See*—
Driscoll, John N.; and Atwood, Edwards S., 4,549,953, Cl. 204-419.000.

Auberon, Marcel; Cabanel, Daniel; Dolbeau, Michel; Phan, Albert; Pillois, Philippe; Bournazel, Claude L.; and Huvey, Michel, to Societe Nationale Industrielle et Aerospatiale; and Institut Francais du Petrole. Process for providing a metal connector fixed to a pipe of composite material and pipe thus made. 4,549,919, Cl. 156-172.000.

Audesse, Emery G.: *See*—
Kimball, Stephen F.; Audesse, Emery G.; and Griffin, Robert M., 4,550,270, Cl. 313-579.000.

Auer, Eberhard; Gehrmann, Klaus; Ohorodnik, Alexander; and Rosenthal, Johannes, to Hoechst Aktiengesellschaft. Process for making alkanephosphonous acid esters. 4,549,995, Cl. 260-973.000.

Auge, Jean; Lavaur, Jacques; and Assens, Michel, to Auge, Jean. Apparatus for automatic measurement and classification of carcases. 4,549,358, Cl. 33-560.000.

Austin, Forrest L., to Cornelius Co., The. Beverage dispensing valve. 4,549,675, Cl. 222-129.100.

Automation Industries, Inc.: *See*—
Ramsey, Robert W., Jr., 4,549,845, Cl. 414-620.000.

Aviram, Ari: *See*—
Sachdev, Krishna G.; and Aviram, Ari, 4,549,824, Cl. 400-241.100.

Ayers, Ralph L.; Stovin, Garfield W.; and Szabo, Robert J., to Variform Plastics, Inc. Mobile home skirting system. 4,549,378, Cl. 52-169.120.

Ayusawa, Kazutoshi; Satoh, Hosaku; and Kazama, Munetada, to Oki Electric Industry Co., Ltd. Microwave dielectric ceramic compositions. 4,550,089, Cl. 501-139.000.

Babcock, Daniel L., to Boeing Company, The. Data bus test instrument having a tri-colored LED and indicating continuity, voltage and polarity. 4,550,287, Cl. 324-73.00R.

Babcock & Wilcox Company, The: *See*—
Keyes, Marion A., IV; Lukas, Michael P.; and Moss, William H., 4,549,503, Cl. 122-479.00R.

Babler, Fridolin, to Ciba Geigy Corporation. Process for the preparation of perylene. 4,550,215, Cl. 585-469.000.

Bachler, Sven, to ASEA Aktiebolag. Electric switch with protective function. 4,550,299, Cl. 335-195.000.

Bacquet, Cathy A.; and Twumasi, Daniel Y., to Kallestad Laboratories, Inc. Method for ligand determination utilizing an immunoassay monitorable by biotin-containing enzymes, and compositions therefor. 4,550,075, Cl. 435-7.000.

Baer, Edmund: *See*—
Ernst, Gunter; Baer, Edmund; Wurz, Dieter; and Dittrich, Hans, 4,549,999, Cl. 261-109.000.

Baermann, Horst. Flexible magnetic sheet for therapeutic use. 4,549,532, Cl. 128-1.300.

Bailey, John G., to Champion International Corporation. Carton for dispensing rolled sheet material. 4,549,689, Cl. 229-17.00S.

Baker, Alfred G.; and Baker, Andrew J. Process for producing hollow, bilayered silicate microspheres. 4,549,892, Cl. 65-21.400.

Baker, Andrew J.: *See*—
Baker, Alfred G.; and Baker, Andrew J., 4,549,892, Cl. 65-21.400.

Baker Perkins Holdings PLC: *See*—
Wilson, Peter G., 4,549,386, Cl. 53-51.000.

Baker, Richard W., to Medtronic, Inc. Pacemaker programmer with telemetric functions. 4,550,370, Cl. 364-413.000.

Baker, Thomas R.; Hittenberger, William H.; and Posen, Boris J., to Kliklok Corporation. Apparatus and method for high speed forming a hinged carton. 4,549,876, Cl. 493-169.000.

Baldwin, John J., to Merck & Co., Inc. 3-Cycloalkylamino-2-OR-propoxycyanopyridines, derivatives thereof, having anti-hypertensive activity. 4,550,117, Cl. 514-344.000.

Ball Corporation: *See*—
Sears, James T., 4,549,695, Cl. 239-265.350.

Bangor Punta Corporation: *See*—
Charron, Dwayne, 4,549,465, Cl. 89-196.000.

Barba, Walter D., to Aeromarine Technology, Inc. Process for the protective sealing of anodic aluminum oxide and its alloys which confers a particular resistance to agressive alkaline agents. 4,549,910, Cl. 148-6.270.

Barkhoudarian, Sarkis, to Rockwell International Corporation. Surface-acoustic-wave, digitized angular accelerometer. 4,549,436, Cl. 73-517.00A.

Barlics, John J. Container. 4,549,693, Cl. 239-58.000.

Barlow, Jeffrey J.; and Smith, Leslie H., to Imperial Chemical Industries plc. Alkanolamine derivatives. 4,550,111, Cl. 514-255.000.

Barmag Barmer Maschinenfabrik AG: *See*—
Dammann, Peter, 4,549,395, Cl. 57-340.000.

Barmatz, Martin B.; Granett, Dan; and Lee, Mark C., to United States of America, National Aeronautics and Space Administration. Vibrating-chamber levitation systems. 4,549,435, Cl. 73-505.000.

Barnes, James K.: *See*—
Barnes, Joey L.; and Barnes, James K., 4,549,656, Cl. 206-589.000.

Barnes, Joey L.; and Barnes, James K. Package device and method of manufacturing. 4,549,656, Cl. 206-589.000.

Barnes, Michael F.: *See*—
Gillig, Steven F.; Fergus, George H.; and Barnes, Michael F., 4,550,426, Cl. 381-46.000.

Barnett, Larry R.: *See*—
Lau, Yue-Ying; and Barnett, Larry R., 4,550,271, Cl. 315-4.000.

Barr, William A. Fifth wheel coupler. 4,549,745, Cl. 280-434.000.

Barrett, L. Paul: *See*—
Keen, Harry J.; and Barrett, L. Paul, 4,549,439, Cl. 73-862.650.

BASF Aktiengesellschaft: *See*—
Disteldorf, Walter; Eisfeld, Wolfgang; and Kohler, Rolf-Dieter, 4,550,208, Cl. 564-329.000.
Dockner, Toni; Kempe, Uwe; and Frank, Anton, 4,550,176, Cl. 548-343.000.
Ernst, Hansgeorg; Gehrken, Henning-Peter; and Paust, Joachim, 4,550,182, Cl. 549-408.000.
Janitschke, Lothar; and Hoffmann, Werner, 4,550,211, Cl. 568-361.000.
Lynch, John; and Elzer, Albert, 4,550,072, Cl. 430-256.000.
Platz, Rolf; Kummer, Rudolf; Schneider, Heinz-Walter; and Schwirten, Kurt, 4,550,195, Cl. 560-206.000.
Ruland, Alfred; Reuther, Wolfgang; Pommer, Ernst-Heinrich; and Ammermann, Eberhard, 4,550,173, Cl. 548-262.000.

BASF Wyandotte Corporation: *See*—
Carver, Thomas G., 4,550,153, Cl. 528-49.000.
Reichel, Curtis J.; and Hartman, Robert J., 4,550,194, Cl. 560-200.000.

Basi, Jagtar S.; and Mandel, Eric, to International Business Machines Corporation. Method for polishing semiconductor wafers with montmorillonite slurry. 4,549,374, Cl. 51-283.00R.

Basile, Raffaele, to Allied Tube & Conduit Corporation. Conduit coupling assembly. 4,549,756, Cl. 285-388.000.

Bass, Leland J.; Shah, Ashwin V.; and Wickwire, Ralph O., to Burroughs Corporation. System for electronically displaying multiple images of a CRT screen such that some images are more prominent than others. 4,550,315, Cl. 340-703.000.

Basset, Jean M. M.; Leconte, Michel; Ollivier, Jean; and Quignard, Francoise, to Societe Nationale Elf Aquitaine. Catalyst for the metathesis of olefins. 4,550,216, Cl. 585-645.000.

Bateman, Charles D.: *See*—
Pulk, Brian E.; and Bateman, Charles D., 4,550,385, Cl. 364-558.000.

Battelle Memorial Institute: *See*—
Sauer, Ronald H., deceased; and Beedlow, Peter A., 4,549,355, Cl. 33-148.00H.

Baughman, Richard J.; and Ginley, David S., to United States of America, Energy. Method for production of free-standing polycrystalline boron phosphide film. 4,550,014, Cl. 423-289.000.

Baumann, Arthur, to Mettler Instrumente AG. Apparatus for automatically monitoring a constant current source in a measuring instrument. 4,549,623, Cl. 177-212.000.

Baumann, Hans D. Mechanical amplifying means for valves and other devices. 4,549,719, Cl. 251-280.000.

Baumhardt, Robert J., to Brunswick Corp. Two cycle loop scavenged engine with improved transfer passage flow. 4,549,507, Cl. 123-59.00B.

Baxter, Gary R.: *See*—
Springer, Richard E.; and Baxter, Gary R., 4,549,829, Cl. 403-57.000.

Bayer Aktiengesellschaft: *See*—
Forster, Heinz; Klauke, Erich; Eue, Ludwig; Schmidt, Robert R.; and Lurssen, Klaus, 4,549,899, Cl. 71-90.000.
Hagemann, Hermann; Klauke, Erich; and Kysela, Ernst, 4,549,994, Cl. 260-544.00F.
Kramer, Wolfgang; Buchel, Karl H.; Elbe, Hans-Ludwig; Kraatz, Udo; Regel, Erik; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Lurssen, Klaus, 4,549,900, Cl. 71-92.000.
Nielinger, Werner; Hermann, Karl H.; and Michael, Dietrich, 4,550,133, Cl. 524-399.000.
Stephan, Gunter; and Schundehutte, Karl Heinz, 4,550,207, Cl. 564-311.000.

Bayer, Hermann: *See*—
Kochy, Fritz B.; and Bayer, Hermann, 4,549,471, Cl. 98-2.090.

Bayerische Motoren Werke A.G.: *See*—
Busch, Lothar; and Orth, Walter, 4,549,692, Cl. 237-12.30A.

Beall, Gary W., to Radecca, Inc. Method of removing organic contaminants from aqueous compositions. 4,549,966, Cl. 210-661.000.

Bechtel, Wolf D.: *See*—
Schneider, Claus; Walther, Gerhard; Weber, Karl-Heinz; Bechtel, Wolf D.; and Boke-Kuhn, Karin, 4,550,106, Cl. 514-212.000.

Bechtolsheim, Andreas, to Sun Microsystems, Inc. High-speed memory and memory management system. 4,550,368, Cl. 364-200.000.

Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Hettinger, William P., Jr.; Kovach, Stephen M.; Palmer, James L.; and Zandona, Oliver J., to Ashland Oil, Inc. Immobilization of vanadia deposited on sorbent materials during treatment of carbo-metallic oils. 4,549,958, Cl. 208-253.000.

Beck, Jean-Paul C.: *See*—
Gueret, Jean-Louis H.; and Beck, Jean-Paul C., 4,549,559, Cl. 132-11.00R.

Beck, Martin H., to Continental Plastic Containers, Inc. Preform with internal barrier and internal layer of high thermal stability and products made from the same. 4,550,043, Cl. 428-36.000.

Becker, Dietmar; and Wilcke, Klaus-Dieter, to Vorwerk & Co. Interholding GmbH. Brush mounting on electric motors equipped with radio-interference suppression chokes, particularly for household appliances such as vacuum cleaners or the like. 4,550,268, Cl. 310-239.000.

Becker, Martin J.: *See*—
Liu, Yen-Ping; Ullman, Edwin F.; and Becker, Martin J., 4,550,017, Cl. 424-11.000.

Becker, William A.; Marlow, Richard A.; and Schlags, William I. Drapery. 4,550,038, Cl. 428-12.000.

Beconpatch Limited: *See*—
McGivern, James F., 4,549,320, Cl. 5-2.00R.

Beedlow, Peter A.: *See*—
Sauer, Ronald H., deceased; and Beedlow, Peter A., 4,549,355, Cl. 33-148.00H.

Beeson, Charles F., to Johnson Service Company. Motorized valve actuator. 4,549,446, Cl. 74-625.000.

Beiersdorf Aktiengesellschaft: *See*—
Malek, Wasfi N., 4,550,052, Cl. 428-323.000.

Belforte, Piero; Garetti, Enzo; and Pilati, Luciano, to Cselt - Centro Studi e Laboratori Telecomunicazioni S.p.A. Modular self-routing PCM switching network for distributed-control telephone exchange. 4,550,398, Cl. 370-66.000.

Belikov, Evgeny V.: *See*—
Minenko, Leonid; Belikov, Evgeny V.; Bobryshev, Oleg V.; Klyatis, Lev M.; Mescheryakov, Ivan K.; Osipov, Viktor G.; Osher, Mikhail I.; and Plyakin, Nikolai P., 4,549,760, Cl. 294-88.000.

Belko, Robert P.: *See*—
Hall, John B.; Sprecker, Mark A.; Belko, Robert P.; Van Loveren, Augustinus G.; and Hanna, Marie R., 4,549,982, Cl. 252-522.00R.

Bell Helmets Inc.: *See*—
Sundahl, James G., 4,549,541, Cl. 128-201.190.

Bellemann, Rudolf; Diehlmann, Rolf; Dobrocsi, Bela; and Wacker, Karl F., to Joh. A. Benckiser Wassertechnik GmbH. Apparatus for cleaning filters in pressurized fluid flow systems. 4,549,961, Cl. 210-108.000.

Bellet, Jean L.: *See*—
Couasnon, Tristan de; and Bellet, Jean L., 4,550,407, Cl. 371-29.000.

Belli, Remo D.: *See*—
Hartry, Donald R.; and Belli, Remo D., 4,549,462, Cl. 84-413.000.

Beloit Corporation: *See*—
Justus, Edgar J., 4,549,415, Cl. 68-158.000.
Lucas, Robert G., 4,549,701, Cl. 242-75.300.

Bentham, Jeremy B., to Shell Oil Company. Apparatus for contacting a liquid with a gas. 4,550,000, Cl. 261-114.00R.

Berg, Lloyd; and Yeh, An-I. Separation of methanol from methyl acetate by extractive distillation. 4,549,938, Cl. 203-51.000.

Bergenwall, Henning. Device for raising and lowering objects. 4,549,720, Cl. 254-124.000.

Bergmann, Konrad, to American Standard Inc. Straight-way valve. 4,549,579, Cl. 137-625.210.

Berkstresser, George W.; Huo, Tai-Chan D.; and Shmulovich, Joseph, to AT&T Bell Laboratories. Visual display system utilizing high luminosity single crystal garnet material. 4,550,256, Cl. 250-483.100.

Bernon, Roland: *See*—
Bothorel, Pierre; Bernon, Roland; and Gabriel, Guy, 4,549,812, Cl. 366-142.000.

Berol Kemi Ab: *See*—
Mathiesen, Mait M.; Gillberg, Lars I.; Hellsten, Karl M. E.; and Karlsson, Gunvor B. T., 4,549,881, Cl. 44-51.000.

Bertels, Augustinus W. M., to Transinvest B.V. Device for converting wind energy into another form of energy. 4,550,259, Cl. 290-55.000.

Berthelot, Daniel; and Girerd, Jean-Paul, to S. A. Martin. Device for instantaneously changing the gluing width of a web of paper in the manufacture of corrugated cardboard, and process for use of such a device. 4,549,924, Cl. 156-470.000.

Bertini, Carlo; and Bruni, Aldo, to AMP Incorporated. Electrical connector with alternative cable exits. 4,549,780, Cl. 339-107.000.

Bessinger, Walter L.; and Hoffman, Keith A., to Knape & Vogt Manufacturing Company. Drawer slide apparatus. 4,549,774, Cl. 308-3.800.

Betts, Robert E.; Crawford, John F.; and McNeill, Robert E., to United States of America, Army. Smoke canister. 4,549,486, Cl. 102-334.000.

Betz Laboratories, Inc.: *See*—
Muccitelli, John A., 4,549,968, Cl. 210-750.000.

Beynie , Claude P., to Societe Anonyme de Telecommunications. Method for transmitting a HDBn code signal with an auxiliary binary signal in a digital transmission line and system for monitoring repeaters in the line by means of auxiliary signals. 4,550,403, Cl. 370-110.100.

Bhagavatula, Venkata A.; and Nolan, Daniel A., to Corning Glass Works. Polarization-retaining single-mode optical waveguide. 4,549,781, Cl. 350-96.300.

Bhattacharjee, Himangshu R.: *See*—
Patel, Gordhanbhai N.; Preziosi, Anthony F.; Bhattacharjee, Himangshu R.; and Lee, Lester T. C., 4,550,150, Cl. 526-233.000.

BHS-Bayerische Berg-, Hutten- und Salzwerke Aktiengesellschaft: *See*—
Jobst, Lothar, 4,549,452, Cl. 83-100.000.

Bickel, Hans: *See*—
Woodward, Robert E.; and Bickel, Hans, 4,550,162, Cl. 544-016.000.

Billard, Alain; Calmettes, Hubert; and Santalucia, Andre , to Societe E. Lacroix - Tous Artifices. Cartridge for launching electromagnetic decoys with multiple charges. 4,549,489, Cl. 102-505.000.

Billings, Raymond J., to Software Distribution Newtork, Inc. Secure copy method and device for stored programs. 4,550,350, Cl. 360-15.000.

Binder, Klaus: *See*—
Krauss, Robert; and Binder, Klaus, 4,549,668, Cl. 220-203.000.

Binnig, Gerd K.; Feenstra, Randall M.; Hodgson, Rodney T.; Rohrer, Heinrich; and Woodall, Jerry M., to International Business Machines Corporation. Narrow line width pattern fabrication. 4,550,257, Cl. 250-492.200.

Birckhead, Robert W., to Alpine Engineered Products, Inc. Method of manufacturing a connector plate, connector plate and machine for manufacturing connector plate. 4,549,838, Cl. 411-468.000.

Biscuiterie Nantaise-BN: *See*—
Cosse, Lionel, 4,549,647, Cl. 198-461.000.

Biser, Roger W.; and Mishark, Joseph E., to Centronics Data Computer Corp. Carriage-mounted velocity multi-deflection compensation for bi-directional ink jet printers. 4,550,320, Cl. 346-75.000.

Bitha, Panayota: *See*—
Hlavka, Joseph J.; Bitha, Panayota; and Lin, Yang-I, 4,550,169, Cl. 548-108.000.

Black & Decker Inc.: *See*—
Carney, Joseph E., 4,550,277, Cl. 318-334.000.

Black, Jonathan: *See*—
Brighton, Carl T.; Black, Jonathan; and Redka, William, 4,549,547, Cl. 128-419.00F.

Blackstone, Scott C.: *See*—
Corboy, John F., Jr.; Jastrzebski, Lubomir L.; Blackstone, Scott C.; and Pagliaro, Robert H., Jr., 4,549,926, Cl. 156-612.000.

Blain, Edward S., to Sundstrand Corporation. Rotating positive displacement scroll apparatus with lubricating pump. 4,549,861, Cl. 418-55.000.

Bland, Linden; and Anderson, Clifford J., to Murphy Oil Company Limited. Metering separator for determining the liquid mass flow rate in a gas-liquid oilfield production stream. 4,549,432, Cl. 73-200.000.

Blanding, Wendell S.; Johnson, Ronald E.; and VanDewoestine, Robert V., to Corning Glass Works. Television panel and method of manufacture. 4,549,928, Cl. 156-660.000.

Blaschim S.p.A.: *See*—
Castaldi, Graziano; and Giordano, Claudio, 4,550,191, Cl. 560-056.000.

Blaser, Eric: *See*—
Ambike, Suhas H.; Grewal, Narinder S.; and Blaser, Eric, 4,550,018, Cl. 424-52.000.

Bligh, Bernard R., to Air Products and Chemicals, Inc. Process and plant for removing methane and argon from crude ammonia synthesis gas. 4,549,890, Cl. 62-18.000.

Bloch, Alf L.; and Tindall, Joseph H., to West Industries, Inc. Tip in equalizing apparatus. 4,549,457, Cl. 83-582.000.

Board of Regents, The University of Texas System, The: *See*—
Folkers, Karl; and Laesecke, Klaus P., 4,550,109, Cl. 514-249.000.

Bobryshev, Oleg V.: *See*—
Minenko, Leonid; Belikov, Evgeny V.; Bobryshev, Oleg V.; Klyatis, Lev M.; Mescheryakov, Ivan K.; Osipov, Viktor G.; Osher, Mikhail I.; and Plyakin, Nikolai P., 4,549,760, Cl. 294-88.000.

BOC Group, Inc., The: *See*—
Gens, Theodore A., 4,550,098, Cl. 502-324.000.
Stanescu, Mircea S.; and Crouch, E. Donald, Jr., 4,549,911, Cl. 148-16.000.

Boden, Richard M.: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Wolff, Robin K.; Boden, Richard M.; and Yoshida, Takao, 4,549,971, Cl. 252-8.600.

Boehringer Ingelheim KG: *See*—
Schneider, Claus; Walther, Gerhard; Weber, Karl-Heinz; Bechtel, Wolf D.; and Boke-Kuhn, Karin, 4,550,106, Cl. 514-212.000.

Boehringer Mannheim GmbH: *See*—
Roder, Albert; Seidel, Hans; and Giffhorn, Friedrich, 4,550,079, Cl. 435-189.000.

Boeing Company, The: *See*—
Babcock, Daniel L., 4,550,287, Cl. 324-73.00R.

Boettcher, Gordon E.; and Crain, Robert W., to United States of America, Energy. Eight electrode optical readout gap. 4,550,273, Cl. 315-151.000.

Boger, Manfred; and Drabek, Jozef, to Ciba Geigy Corporation. 1,3,5-Oxadiazine-2,4-diones and pesticidal use. 4,550,108, Cl. 514-232.000.

Bohner, Beat; Fory, Werner; Gass, Karl; and Meyer, Willy, to Ciba-Geigy Corporation. N-Heterocyclosulfonyl-N'-pyrimidinylureas and N-heterocyclosulfonyl-N'-triazinylureas. 4,549,898, Cl. 71-90.000.

Boke-Kuhn, Karin: *See—*
Schneider, Claus; Walther, Gerhard; Weber, Karl-Heinz; Bechtel, Wolf D.; and Boke-Kuhn, Karin, 4,550,106, Cl. 514-212.000.

Bolin, Philip C.; Bowman, Gary K.; Ellis, Charles S.; Hopkins, Melvyn D.; and Kane, Richard E., to Westinghouse Electric Corp. Modularly constructed gas-insulated transmission line, and method of assembling same. 4,550,219, Cl. 174-21.00C.

Bookbinder, David. Pulsating lamp system for vehicles. 4,550,305, Cl. 340-134.000.

Borucki, John S.: *See—*
Vukmanic, Ronald W.; Borucki, John S.; and Stanley, Chester A., 4,549,383, Cl. 52-667.000.

Bose, Amar G., to Bose Corporation. Multiple porting loudspeaker systems. 4,549,631, Cl. 181-155.000.

Bose Corporation: *See—*
Bose, Amar G., 4,549,631, Cl. 181-155.000.

Bose, Debasis; Datta, Amitava; and DeCristofaro, Nicholas J., to Allied Corporation. Homogeneous low melting point copper based alloys. 4,549,687, Cl. 228-263.180.

Bothorel, Pierre; Bernon, Roland; and Gabriel, Guy, to Centre National de la Recherche Scientifique. Liquid phase counter. 4,549,812, Cl. 366-142.000.

Bourgeois, Jacques, to Serta-Societe d'Etudes et de Realisations des Techniques d'Automatisme. Process and device for depositing a label on the walls of a mold of an extrusion/blow-molding machine. 4,549,863, Cl. 425-126.00R.

Bournazel, Claude L.: *See—*
Auberon, Marcel; Cabanel, Daniel; Dolbeau, Michel; Phan, Albert; Pillois, Philippe; Bournazel, Claude L.; and Huvey, Michel, 4,549,919, Cl. 156-172.000.

Boute, Willem: *See—*
Wittkampf, Frederik H. M.; and Boute, Willem, 4,549,548, Cl. 128-419.0PG.

Bouthillier, Robert, to Louis Hand, Inc. Stitch shortening device for a blind stitch sewing machine. 4,549,495, Cl. 112-315.000.

Boutin, Jean, to Rhone-Poulenc Specialites Chimiques. Free-flowing flakes of hydrophilic/water-soluble polymer gel. 4,550,033, Cl. 427-222.000.

Bowles, Patrick J.; and Garrett, Lloyd W., to General Electric Company. Article accumulator and transfer system and method. 4,549,644, Cl. 198-341.000.

Bowman, Gary K.: *See—*
Bolin, Philip C.; Bowman, Gary K.; Ellis, Charles S.; Hopkins, Melvyn D.; and Kane, Richard E., 4,550,219, Cl. 174-21.00C.

Boyette, Gerald B.: *See—*
Gupta, Tapan K.; Carlson, William G.; Osterhout, Joseph C.; Boyette, Gerald B.; and Sweetana, Andrew S., Jr., 4,549,981, Cl. 252-518.000.

Boyle, Alan: *See—*
Hawkins, Albert P.; Boyle, Alan; and Stone, Alan M., 4,549,659, Cl. 209-3.200.

Brail, Fred: *See—*
Foley, Daniel M., Jr., 4,349,369, Cl. 49-279.000.

Brandenstein, Manfred: *See—*
Hans, Rudiger; and Brandenstein, Manfred, 4,549,442, Cl. 74-110.000.

Brandes, Wilhelm: *See—*
Kramer, Wolfgang; Buchel, Karl H.; Elbe, Hans-Ludwig; Kraatz, Udo; Regel, Erik; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Lurssen, Klaus, 4,549,900, Cl. 71-92.000.

Branning, Merle L., to Nalco Chemical Company. Flocculant composition. 4,549,967, Cl. 210-728.000.

Braun, Oskar J.; Hubler, Lawrence C.; and Sisson, Jeffrey L., to Xerox Corporation. High speed duplicator with sorter/stapling apparatus and copy set supporting system. 4,549,804, Cl. 355-14.0SH.

Brawn, Ronald J.: *See—*
Groshong, LeRoy E.; and Brawn, Ronald J., 4,549,879, Cl. 604-247.000.

Braymer, Joseph E.: *See—*
Kropiwnicki, Tadek M.; and Braymer, Joseph E., 4,549,857, Cl. 417-312.000.

Brechbuhler, Fritz, to Pebea N.V. Reinforcing rod holder for use in connection-type concrete pouring operations and a method of producing same. 4,549,384, Cl. 52-704.000.

Breckenridge, Gerald H. Spray valve assembly. 4,549,573, Cl. 137-495.000.

Brenman, Henry S.: *See—*
Katz, Philip; Brenman, Henry S.; Lowry, Louis D.; and Schwartz, Harold, 4,550,427, Cl. 381-70.000.

Bridgestone Tire Company Limited: *See—*
Yahagi, Mitsuhisa; Masunaga, Mikio; Watanabe, Shuichi; and Tanaka, Tsutomu, 4,549,593, Cl. 152-330.00R.
Yazaki, Susumu; and Nagano, Jun, 4,549,453, Cl. 83-365.000.

Brierley, Keith: *See—*
Sargent, Colin R.; Brierley, Keith; Wotton, David E. M.; and Coe, Paul L., 4,549,686, Cl. 228-242.000.

Brighton, Carl T.; Black, Jonathan; and Redka, William, to University of Pennsylvania, Trustees of the. Implantable bone growth stimulator. 4,549,547, Cl. 128-419.00F.

Brockhaus, Peter B. Waterbed mattress pad. 4,549,323, Cl. 5-455.000.

Brooklyn Union Gas Company: *See—*
Nimke, Helmut E.; and Thomas, William R., 4,549,752, Cl. 285-55.000.

Brooks, Jeffrey B.; and Larson, Warren M., to Markem Corporation. Vertical magnetic brush developing apparatus and method. 4,550,068, Cl. 430-122.000.

Brough, Denys W.; and Lawrence, Christopher J., to Rieter-Scragg Limited. Yarn heater. 4,549,361, Cl. 34-17.000.

Brouwer, Marius S.; and Grosscurt, Arnoldus C., to Duphar International Research B.V. Benzoylurea compounds, and pesticidal and pharmaceutical compositions comprising same. 4,550,202, Cl. 564-23.000.

Brown, Arthur E.: *See—*
Park, Hyun D.; and Brown, Arthur E., 4,550,088, Cl. 501-135.000.

Brown, Graydon L., to Conoco Inc. Continuous shear wave logging apparatus. 4,549,630, Cl. 181-106.000.

Brown, Richard L., to Idea Engineering Company. Precise intermittent feeding apparatus for edgewise perforated carrier sheet material. 4,549,680, Cl. 226-76.000.

Brown, William G., II. Steam absorber. 4,549,604, Cl. 165-110.000.

Bruni, Aldo: *See—*
Bertini, Carlo; and Bruni, Aldo, 4,549,780, Cl. 339-107.000.

Brunswick Corp.: *See—*
Baumhardt, Robert J., 4,549,507, Cl. 123-59.00B.
Councilman, Richard R., 4,549,702, Cl. 242-84.51A.

Brusch, Josef: *See—*
Hanni, Manfred; and Brusch, Josef, 4,550,222, Cl. 179-1.50R.

BS&B Safety Systems, Inc.: *See—*
Short, Edward H., III, 4,549,565, Cl. 137-71.000.

Buchanan, James E.; and Shipley, John M., to United States of America, Army. Horizontal sync detector. 4,550,342, Cl. 358-153.000.

Buchberger, Gerhard: *See—*
Felcht, Utz-Hellmuth; and Buchberger, Gerhard, 4,550,161, Cl. 536-90.000.

Buchel, Karl H.: *See—*
Kramer, Wolfgang; Buchel, Karl H.; Elbe, Hans-Ludwig; Kraatz, Udo; Regel, Erik; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Lurssen, Klaus, 4,549,900, Cl. 71-92.000.

Buck, George S., Jr., to Fiberlok, Inc. Fiberous batt. 4,550,050, Cl. 428-283.000.

Buckley, Michael J., to North American Philips Consumer Electronics Corp. Cathode ray tube with composite mounting structure. 4,550,344, Cl. 358-248.000.

Bukowski, James M.; Midock, Gary E.; and Walko, Ronald J., to Westinghouse Electric Corp. Microprocessor-based extraction turbine control. 4,550,380, Cl. 364-494.000.

Bulbenko, George F.: *See—*
Woodbridge, J. Eliot; Bulbenko, George F.; and Marshall, J. John, 4,550,077, Cl. 435-22.000.

Bulso, Joseph D., Jr.; Doyle, Stephen D.; and McClung, James A., to Redicon Corporation. Shell tooling method. 4,549,424, Cl. 72-329.000.

Buonicore, Anthony J., to Buonicore-Cashman Associates, Inc. Apparatus for hot degassing residual olefin oxide from sterilized product. 4,549,363, Cl. 34-216.000.

Buonicore-Cashman Associates, Inc.: *See—*
Buonicore, Anthony J., 4,549,363, Cl. 34-216.000.

Burbank, Raymond W.; and Myers, Christopher A., to Motorola, Inc. Shock absorbing transducer module. 4,550,429, Cl. 381-90.000.

Burk, Gerhard; and Rau, Wolfgang, to Daimler-Benz Aktiengesellschaft. Arrangement for discharging hot air from the engine compartment of motor vehicles. 4,549,762, Cl. 296-208.000.

Burkel, Heinz, to REHAU Plastiks AG & Co. Method of making blow-molded parts of thermoplastic material. 4,550,009, Cl. 264-529.000.

Burlington Industries, Inc.: *See—*
Gamblin, Rodger L., 4,550,323, Cl. 346-75.000.

Burr-Brown Corporation: *See—*
Millaway, Steven D.; and Graeme, Jerald G., 4,550,291, Cl. 330-277.000.

Burroughs Corporation: *See—*
Bass, Leland J.; Shah, Ashwin V.; and Wickwire, Ralph O., 4,550,315, Cl. 340-703.000.

Burroughs Wellcome Co.: *See—*
Farrell, Geoffrey, 4,549,996, Cl. 261-19.000.

Burtchell, Darrell A. Tappet. 4,549,509, Cl. 123-90.160.

Burton, Thomas M.: *See—*
Kucharska, Helena Z.; and Burton, Thomas M., 4,550,124, Cl. 521-85.000.

Burzin, Klaus: *See—*
Droescher, Michael; Burzin, Klaus; Gerth, Christian; and Heuer, Horst, 4,550,148, Cl. 525-440.000.

Busch, Edgar: *See—*
Albrecht, Ernst; and Busch, Edgar, 4,549,491, Cl. 112-73.000.
Albrecht, Ernst; and Busch, Edgar, 4,549,492, Cl. 112-76.000.

Busch, Erwin, to Thermohauser Erwin Busch GmbH. Rotatable stand. 4,549,714, Cl. 248-349.000.

Busch, Lothar; and Orth, Walter, to Bayerische Motoren Werke A.G. Heating and/or air-conditioning installation for motor vehicles. 4,549,692, Cl. 237-12.30A.

Buschmann, Gerd: *See—*
Schoen, Uwe; Hachmeister, Bernd; Kehrbach, Wolfgang; Kuehl, Ulrich; and Buschmann, Gerd, 4,550,112, Cl. 514-278.000.

Bustle, Robert G. Animal trap. 4,549,368, Cl. 43-88.000.

Butcher, Peter J. L.: *See—*
Stonestreet, Paul R.; Williams, David; Anderson, Kenneth; and Butcher, Peter J. L., 4,550,411, Cl. 373-134.000.

Byrd, Carlisle O., Jr., to Manville Service Corporation. Fiber blanket insulation module. 4,549,382, Cl. 52-506.000.

C. C. Jensen A/S: *See—*
Jensen, Carl A.; and Rasmussen, Ib O., 4,549,963, Cl. 210-314.000.

Cabanel, Daniel: *See*—
Auberon, Marcel; Cabanel, Daniel; Dolbeau, Michel; Phan, Albert; Pillois, Philippe; Bournazel, Claude L.; and Huvey, Michel, 4,549,919, Cl. 156-172.000.
Cain, Charles A.; and Frizzell, Leon A., to University of Illinois. Apparatus and method for generating and directing ultrasound. 4,549,533, Cl. 128-24.00A.
Caldwell, Theresa: *See*—
Cushing, Nelson N., 4,549,612, Cl. 175-20.000.
California Institute of Technology: *See*—
Yen, Shiao-Ping S.; Carter, Boyd J.; Shen, David H.; and Somoano, Robert B., 4,550,064, Cl. 429-94.000.
Callahan, Michael; and Goddard, Robert M. Buss structures for multiscene manual lighting consoles. 4,550,276, Cl. 315-312.000.
Calmettes, Hubert: *See*—
Billard, Alain; Calmettes, Hubert; and Santalucia, Andre 4,549,489, Cl. 102-505.000.
Can-Dive Services Ltd.: *See*—
Nuytten, Rene T., 4,549,753, Cl. 285-95.000.
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defense: *See*—
Dyck, Walter R.; and Eirich, Ronald A., 4,549,551, Cl. 128-689.000.
Canon Kabushiki Kaisha: *See*—
Arai, Ryuichi; and Toganoh, Shigeo, 4,550,053, Cl. 428-304.400.
Miyakawa, Akira, 4,550,327, Cl. 346-140.00R.
Ohno, Akio; and Takeda, Kenji, 4,549,803, Cl. 355-14.0FU.
Ohtaka, Keiji, 4,549,802, Cl. 354-403.000.
Capmakers, Ltd.: *See*—
Johnson, Kenneth L., 4,549,316, Cl. 2-195.000.
Capriotti, Dante R., to Du Pont de Nemours, E. I., and Company. Peroxide-curable bromine-containing fluoroelastomers containing a sulfone. 4,550,132, Cl. 524-84.000.
Carlson, Gordon S.: *See*—
Crowley, George C.; Carlson, Gordon S.; and Woznicki, Michael, 4,550,358, Cl. 361-42.000.
Carlson, John E. Holographic system for the storage of audio, video and computer data. 4,550,395, Cl. 369-103.000.
Carlson, William G.: *See*—
Gupta, Tapan K.; Carlson, William G.; Osterhout, Joseph C.; Boyette, Gerald B.; and Sweetana, Andrew S., Jr., 4,549,981, Cl. 252-518.000.
Carney, Joseph E., to Black & Decker Inc. Overload detection and warning system for electric motors in power tools and the like. 4,550,277, Cl. 318-334.000.
Caron, Francois G., to International Business Machines Corp. Odynamical operating rate allocation process in a multiplex communication system. 4,550,399, Cl. 370-80.000.
Carr, Keith E.: *See*—
Martin, William J.; Carr, Keith E.; and Peterson, Edward C., 4,549,328, Cl. 15-338.000.
Carrier Corporation: *See*—
Anderson, Gordon K.; and Savage, William S., 4,549,405, Cl. 62-239.000.
Kropiwnicki, Tadek M.; and Braymer, Joseph E., 4,549,857, Cl. 417-312.000.
Lord, Richard G.; and Nieva, Kenneth J., 4,549,403, Cl. 62-201.000.
Lord, Richard G., 4,549,404, Cl. 62-224.000.
Wellman, Donald C.; and Clark, William E., 4,549,601, Cl. 165-2.000.
Carroll, Robert B.: *See*—
Thompson, Richard T.; Hinkle, Philip; and Carroll, Robert B., 4,550,041, Cl. 428-35.000.
Carroll, Roger W. Cutting tool guide. 4,549,725, Cl. 266-58.000.
Carruthers, James D.: *See*—
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Hettinger, William P., Jr.; Kovach, Stephen M.; Palmer, James L.; and Zandona, Oliver J., 4,549,958, Cl. 208-253.000.
Carter, Boyd J.: *See*—
Yen, Shiao-Ping S.; Carter, Boyd J.; Shen, David H.; and Somoano, Robert B., 4,550,064, Cl. 429-94.000.
Carter, Donald F., to Foto, Anthony J. Tape cassette holder. 4,549,775, Cl. 312-15.000.
Carver, Thomas G., to BASF Wyandotte Corporation. Elastomer based on crude diphenylmethane diisocyanate and aniline in the RIM process. 4,550,153, Cl. 528-49.000.
Casadio, Silvano: *See*—
Nardi, Dante; Tajana, Alberto; Pennini, Renzo; Cazzulani, Pietro; Graziani, Gabriele; and Casadio, Silvano, 4,550,115, Cl. 514-320.000.
Case, Wayne A. Downhole tool with replaceable tool sleeve sections. 4,549,613, Cl. 175-325.000.
Cash Engineering Co. Pty. Ltd.: *See*—
Cash, John; and Kitchener, John A., 4,549,856, Cl. 417-295.000.
Cash, John; and Kitchener, John A., to Cash Engineering Co. Pty. Ltd. Compressor control system. 4,549,856, Cl. 417-295.000.
Cason, Charles K.: *See*—
Hoffstetter, Armand C. L.; and Cason, Charles K., 4,549,729, Cl. 270-53.000.
Caspari, Richard B.; Whipple, Terry L.; and Thimsen, James A., to Precision Surgical Instruments, Inc. Thigh restraining apparatus and method. 4,549,540, Cl. 128-133.000.
Castaldi, Graziano; and Giordano, Claudio, to Blaschim S.p.A. Process for preparing esters of 2'-(6'-methoxy-2-naphthyl)-propionic acid. 4,550,191, Cl. 560-056.000.
Castilano, Charles R., to Jackson Enterprises. Cable block device. 4,549,723, Cl. 254-405.000.
Castle, Gary M. Two-piece snap-lock facia border. 4,549,377, Cl. 52-94.000.
Castonguay, Roger N.: *See*—
Jencks, Charles L.; and Castonguay, Roger N., 4,550,300, Cl. 335-16.000.
Caterpillar Tractor Co.: *See*—
Nichting, Robert P., 4,549,823, Cl. 384-537.000.
Catheter Technology Corporation: *See*—
Groshong, LeRoy E.; and Brawn, Ronald J., 4,549,879, Cl. 604-247.000.
Catrambone, Frank A.: *See*—
Dee, Gerald M.; and Catrambone, Frank A., 4,549,620, Cl. 177-60.000.
Cazzulani, Pietro: *See*—
Nardi, Dante; Tajana, Alberto; Pennini, Renzo; Cazzulani, Pietro; Graziani, Gabriele; and Casadio, Silvano, 4,550,115, Cl. 514-320.000.
Celanese Corporation: *See*—
Kohn, Rachel S., 4,549,907, Cl. 106-208.000.
Thigpen, Hubert H.; and Clos, Richard J., 4,550,213, Cl. 568-458.000.
Centrale Laitiere de Haute Normandie: *See*—
Montigny, Jean, 4,550,028, Cl. 426-582.000.
Centralen Mashinostroitelen Institute: *See*—
Makedonski, Boris G.; and Atanassov, Haralampi A., 4,549,370, Cl. 51-7.000.
Centre de Recherche Industrielle du Quebec: *See*—
Elmaraghy, Rachik; and Fontaine, Michel, 4,549,456, Cl. 83-478.000.
Centre National de la Recherche Scientifique: *See*—
Bothorel, Pierre; Bernon, Roland; and Gabriel, Guy, 4,549,812, Cl. 366-142.000.
Martin, Gerard J.; and Martin, Maryvonne L., 4,550,082, Cl. 436-24.000.
Centro Sperimentale Metallurgico S.p.A.: *See*—
Marino, Emilio; and Ramacciotti, Aldo, 4,549,677, Cl. 222-591.000.
Centronics Data Computer Corp.: *See*—
Biser, Roger W.; and Mishark, Joseph E., 4,550,320, Cl. 346-75.000.
Chaki, Takao, to Clarion Co., Ltd. Arm mechanism of a pushbutton type tuner. 4,549,441, Cl. 74-10.330.
Champion International Corporation: *See*—
Bailey, John G., 4,549,689, Cl. 229-17.00S.
Lepisto, J. George, 4,550,442, Cl. 383-113.000.
Tiesman, Randy J., 4,549,654, Cl. 206-486.000.
Champlin, Charles L., to Packaging Corporation of America. Article carrier. 4,549,650, Cl. 206-179.000.
Chandler, Henry M.: *See*—
Herrin, Melvin B.; and Chandler, Henry M., 4,549,878, Cl. 493-334.000.
Chandra, Grish; Kosal, Jeffrey A.; Petroff, Lenin J.; and Plueddemann, Edwin P., to Dow Corning Corporation. Detergent composition with siliconate-silicate copolymer. 4,549,979, Cl. 252-135.000.
Chang, Clarence D.; and Miale, Joseph N., to Mobil Oil Corporation. Activity enhancement of high silica zeolites. 4,550,092, Cl. 502-71.000.
Chao, Herbert S.: *See*—
Rimsa, Stephen B.; Harris, James E.; Chao, Herbert S.; and Maresca, Louis M., 4,550,140, Cl. 525-132.000.
Charbonnages de France: *See*—
Chelu, Gerard, 4,550,010, Cl. 422-4.000.
Charles Stark Draper Laboratory, Inc.: *See*—
Guinon, Walter J.; and Lamb, Richard H., Jr., 4,550,414, Cl. 375-1.000.
Charron, Dwayne, to Bangor Punta Corporation. Slide stop plate assembly for a handgun. 4,549,465, Cl. 89-196.000.
Chattha, Mohinder S.: *See*—
Johnson, Milton D.; and Chattha, Mohinder S., 4,550,201, Cl. 564-15.000.
Chauviere, Henri: *See*—
Vettori, Claude; and Chauviere, Henri, 4,549,858, Cl. 417-353.000.
Chellis, Leroy N., to International Business Machines Corporation. Epoxy composition. 4,550,128, Cl. 523-433.000.
Chelu, Gerard, to Charbonnages de France. Process for deodorizing polluted air. 4,550,010, Cl. 422-4.000.
Chemische Werke Huels Aktiengesellschaft: *See*—
Droescher, Michael; Burzin, Klaus; Gerth, Christian; and Heuer, Horst, 4,550,148, Cl. 525-440.000.
Chemische Werke Huls Aktiengesellschaft: *See*—
Disteldorf, Josef; Hubel, Werner; and Reiffer, Johannes, 4,549,991, Cl. 260-453.0PH.
Chemla, Daniel S., to AT&T Bell Laboratories. Intensity of a light beam applied to a layered semiconductor structure controls the beam. 4,549,788, Cl. 350-354.000.
Chen, Gun-Shing: *See*—
Saunders, Donna D.; Kalsi, Manmohan S.; and Chen, Gun-Shing, 4,549,754, Cl. 285-334.000.
Chenausky, Peter P.; Hoffman, Nelson N.; and Laughman, Lanny M., to United Technologies Corporation. Coupled-cavity laser. 4,550,410, Cl. 372-97.000.
Cheng, Dah Y., to International Power Technology, Inc. Control system for Cheng dual-fluid cycle engine system. 4,549,397, Cl. 60-39.300.
Cheng, Fred T. J.; and Sauer, Don R., to National Semiconductor Corporation. PM Decoder sample and hold circuit. 4,550,424, Cl. 381-15.000.

Cheng, Paul J., to Phillips Petroleum Company. Decreasing carbon black reactor fouling rate. 4,550,013, Cl. 422-151.000.

Cherry Electrical Products Corporation: *See*—
Leger, Raymond A., 4,550,233, Cl. 200-61.620.

Cheung, Li-Fung: *See*—
Zomorrodi, Mehrdad; Cheung, Li-Fung; and Law, Simon M. L., 4,550,254, Cl. 250-338.000.

Chevron Research Company: *See*—
Shippey, Michael A., 4,550,197, Cl. 562-460.000.

Chiba, Hiromasa; Kumahara, Katsumi; Harada, Takakiyo; Oka, Takahiro; and Sato, Akihiro, to Chisso Corporation. Propylene-ethylene copolymers for high-rigidity molded products and process for producing the same. 4,550,144, Cl. 525-247.000.

Chicago Metallic Corporation: *See*—
Vukmanic, Ronald W.; Borucki, John S.; and Stanley, Chester A., 4,549,383, Cl. 52-667.000.

Chida, Tsuneaki: *See*—
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizu, Susumu; Watanabe, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,549,902, Cl. 71-90.000.

Chien, Chao-Huei. Multiple-effect respirator. 4,549,542, Cl. 128-201.240.

Chikazawa, Nobumoto; Muraoka, Toshiharu; and Fujii, Setsuro, to Maruho Co., Ltd. Rapid assaying method for guanase. 4,550,076, Cl. 435-18.000.

Chisso Corporation: *See*—
Chiba, Hiromasa; Kumahara, Katsumi; Harada, Takakiyo; Oka, Takahiro; and Sato, Akihiro, 4,550,144, Cl. 525-247.000.

Chodrow, Mark M.; Sander, Bernard T., Jr.; Sharpless, Charles H.; and Theriot, Eugene J., to AT&T Bell Laboratories. Switching system having remote switching capability. 4,550,404, Cl. 370-110.100.

Chrysler Corporation: *See*—
Hormel, Ronald F.; and Miesterfeld, Frederick O. R., 4,550,261, Cl. 307-118.000.

Chu, Pochen, to Mobil Oil Corporation. Octane and total yield improvements in catalytic cracking. 4,549,956, Cl. 208-120.000.

Chu, Pochen, to Mobil Oil Corporation. Hydrocarbon synthesis with zeolite catalyst of improved hydrothermal stability. 4,550,218, Cl. 585-408.000.

Chung, Randall; and Ambrosius, William, III, to Western Digital Corporation. Data capture window extension circuit. 4,550,391, Cl. 365-233.000.

Ciba-Geigy AG: *See*—
Schmutz, Paul; and Angliker, Hans-Jorg, 4,549,989, Cl. 260-378.000.

Ciba Geigy Corporation: *See*—
Babler, Fridolin, 4,550,215, Cl. 585-469.000.
Boger, Manfred; and Drabek, Jozef, 4,550,108, Cl. 514-232.000.
Bohner, Beat; Fory, Werner; Gass, Karl; and Meyer, Willy, 4,549,898, Cl. 71-90.000.
Karlen, Urs; Putzai, Roland; and Schaulin, Rudolf, 4,550,178, Cl. 548-426.000.
Martin, Pierre, 4,550,165, Cl. 546-94.000.
Mockli, Peter, 4,550,171, Cl. 548-159.000.
Stockinger, Friedrich; Lohse, Friedrich; and Zondler, Helmut, 4,550,203, Cl. 564-105.000.
Woodward, Robert E.; and Bickel, Hans, 4,550,162, Cl. 544-016.000.

Citizen Watch Co., Ltd.: *See*—
Nishikubo, Yasuhiko; Fujikawa, Toyoharu; and Tanaka, Tsutomu, 4,549,818, Cl. 374-178.000.
Tamaru, Munetaka; and Suzuki, Naomichi, 4,550,324, Cl. 346-76.0PH.

Clarion Co., Ltd.: *See*—
Chaki, Takao, 4,549,441, Cl. 74-10.330.
Yanagishima, Takayuki; Kasai, Junichi; Ajimine, Akio; Watanabe, Tatsuya; Shino, Akimitsu; and Murakami, Yoshiaki, 4,550,428, Cl. 381-86.000.

Clark, William E.: *See*—
Wellman, Donald C.; and Clark, William E., 4,549,601, Cl. 165-2.000.

Cloostermans-Huwaert, Leon R. L. G., to Lamitref Aluminium. Method for manufacturing wire. 4,549,420, Cl. 72-41.000.

Clos, Richard J.: *See*—
Thigpen, Hubert H.; and Clos, Richard J., 4,550,213, Cl. 568-458.000.

Coash, Ronald J.: *See*—
Davis, John E.; Zielke, Terry L.; and Coash, Ronald J., 4,549,694, Cl. 239-710.000.

Coe, Paul L.: *See*—
Sargent, Colin R.; Brierley, Keith; Wotton, David E. M.; and Coe, Paul L., 4,549,686, Cl. 228-242.000.

Cogswell, Frederic N.; and Hezzell, David J., to Imperial Chemical Industries, PLC. Method for impregnating filaments with thermoplastic. 4,549,920, Cl. 156-181.000.

Cohen, Alfred S.; and Wessing, Joseph C., Jr. Hanger for supporting pipe below steel reinforced concrete slab foundations. 4,549,385, Cl. 52-742.000.

Cohen, Mitchell S.: *See*—
Sachdev, Krishna G.; Shear, Stephen A.; Pennington, Keith S.; and Cohen, Mitchell S., 4,550,061, Cl. 428-461.000.

Coley, Charles R., to Plus One Ltd. Button for receiving and securing a fabric covering therefor and fabric-covered button assembly formed therewith. 4,549,331, Cl. 24-92.000.

Colgate-Palmolive Company: *See*—
Joshi, David; and Klingaman, Richard, 4,549,977, Cl. 252-90.000.

Collins, John M., Jr.: *See*—
Shimrock, Thomas; Taylor, R. Dirk; and Collins, John M., Jr., 4,550,034, Cl. 427-243.000.

Collins, Patrick C.; and Gasaway, John M., to General Electric Company. Soft top coated shaped polycarbonate article. 4,550,058, Cl. 428-412.000.

Colt Industries Operating Corp: *See*—
Keen, Harry J.; and Barrett, L. Paul, 4,549,439, Cl. 73-862.650.

Columbus, Richard L., to Eastman Kodak Company. Capillary transport device having means for increasing the viscosity of the transported liquid. 4,549,952, Cl. 204-416.000.

Combustion Engineering, Inc.: *See*—
Alexander, M. Grayson; and Riley, Brian, 4,550,066, Cl. 429-191.000.

Comez S.p.A.: *See*—
Zorini, Luigi O.; and Zorzoli, Walter, 4,549,414, Cl. 66-203.000.

Commissariat a l'Energie Atomique: *See*—
Glachet, Charles; Francois, Daniel; Tentelier, Jean; and Frioux, Christian, 4,549,839, Cl. 414-7.000.

Compagnie Generale des Etablissements Michelin: *See*—
Ancel, Christian; and Philibert, Pierre, 4,549,594, Cl. 152-359.000.

Compagnie Industrielle de Mecanismes: *See*—
Crossonneau, Denis, 4,549,771, Cl. 308-3.00R.

Compen, Johannes M. A. A.; and van Kemenade, Wilhelmus M. P., to U.S. Philips Corporation. Electric discharge tube and method of manufacturing an electrically conductive layer on a wall portion of the envelope of such a tube. 4,550,032, Cl. 427-64.000.

Computer Basic Technology Research: *See*—
Hirai, Osamu; Kobayashi, Tetsuo; Kuwatsuka, Shunichiro; and Suzuki, Saburo, 4,550,353, Cl. 360-125.000.

Conoco Inc.: *See*—
Brown, Graydon L., 4,549,630, Cl. 181-106.000.
Graf, Harlan G.; Janssen, Harry R.; and Kurdy, George A., 4,549,934, Cl. 196-98.000.
Peterson, Marvin L.; Putnik, Charles F.; and Maxson, Orwin G., 4,549,948, Cl. 204-196.000.

Consolidated Devices, Inc.: *See*—
Grabovac, Bosko; and Vuceta, Ivan, 4,549,438, Cl. 73-862.210.

Continental Plastic Containers, Inc.: *See*—
Beck, Martin H., 4,550,043, Cl. 428-36.000.

Convis, Danny B.; Grimm, Paul J.; and Reed, Martin A., to International Business Machines Corporation. Retro-stroke compression and image generation of script and graphic data employing an information processing system. 4,550,438, Cl. 382-56.000.

Cook, Kenneth D.; and Proctor, Timothy R. Waste disposal monitoring system. 4,549,570, Cl. 137-389.000.

Cooper, Joseph S.: *See*—
Judd, Michael; and Cooper, Joseph S., 4,549,933, Cl. 162-281.000.

Coplan, Myron J.: *See*—
Lopatin, George; Coplan, Myron J.; and Walton, James P., Jr., 4,550,123, Cl. 521-64.000.

Corbett, Scott S., Jr.; Perrott, Lynn F.; and Reiersgaard, William L., to Corbett, Scott S., Jr.; and Perrott, Lynn F. Storage system for trailer frames. 4,549,663, Cl. 211-13.000.

Corboy, John F., Jr.; Jastrzebski, Lubomir L.; Blackstone, Scott C.; and Pagliaro, Robert H., Jr., to RCA Corporation. Method for growing monocrystalline silicon on a mask layer. 4,549,926, Cl. 156-612.000.

Cordis Corporation: *See*—
Tarjan, Peter P.; Miller, Sandra L.; and Martin, John, 4,549,556, Cl. 128-785.000.

Cornelius Co., The: *See*—
Austin, Forrest L., 4,549,675, Cl. 222-129.100.

Cornelius, Edward B.: *See*—
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Hettinger, William P., Jr.; Kovach, Stephen M.; Palmer, James L.; and Zandona, Oliver J., 4,549,958, Cl. 208-253.000.

Corning Glass Works: *See*—
Adamowicz, John A.; Schlup, John R.; and Spotz, Mark S., 4,549,931, Cl. 162-145.000.
Araujo, Roger J.; Hares, George B.; Kerko, David J.; Morgan, David W.; and Morse, David L., 4,549,894, Cl. 65-30.110.
Bhagavatula, Venkata A.; and Nolan, Daniel A., 4,549,781, Cl. 350-96.300.
Blanding, Wendell S.; Johnson, Ronald E.; and VanDewoestine, Robert V., 4,549,928, Cl. 156-660.000.
Kerko, David J.; Morgan, David W.; and Thompson, Richard W., 4,550,087, Cl. 501-13.000.

Cosden Technology, Inc.: *See*—
Morris, Jeffrey D.; and Fuller, Robert A., 4,550,149, Cl. 526-68.000.

Cosse, Lionel, to Biscuiterie Nantaise-BN. Apparatus for the transfer of articles between two machines. 4,549,647, Cl. 198-461.000.

Costruzioni Aeronautiche Giovanni Agusta S.p.A.: *See*—
Pariani, Emilio, 4,549,851, Cl. 416-140.000.

Couasnon, Tristan de; and Bellet, Jean L. Method of analyzing broadcast data, a network analyzer implementing such a method, and receiver equipment using such an analyzer. 4,550,407, Cl. 371-29.000.

Councilman, Richard R., to Brunswick Corporation. Drag for spinning reel. 4,549,702, Cl. 242-84.51A.

Covill, James H.: *See*—
Kelly, Michael G.; and Covill, James H., 4,550,189, Cl. 560-044.000.

Cox, David L.; Ross, William E.; and Toche, Calvin A., to Litton Systems, Inc. Apparatus and method for switching a magnetic domain lens. 4,550,389, Cl. 365-37.000.

CRA Exploration Pty. Ltd.: *See*—
Hawkins, Albert P.; Boyle, Alan; and Stone, Alan M., 4,549,659, Cl. 209-3.200.
Craemer, Robert H., to Molins Machine Company, Inc. Proximity flute detection. 4,550,377, Cl. 364-471.000.
Crain, Robert W.: *See*—
Boettcher, Gordon E.; and Crain, Robert W., 4,550,273, Cl. 315-151.000.
Crates, Charles A., to SMS Schloemann-Siemag, Inc. Apparatus to distribute a highly-pressurized fluid medium. 4,549,822, Cl. 384-462.000.
Crawford, Joha F.: *See*—
Betts, Robert E.; Crawford, John F.; and McNeill, Robert E., 4,549,486, Cl. 102-334.000.
Creative Products Resource Associates, Ltd.: *See*—
Smith, James A., 4,550,035, Cl. 427-398.100.
Creel, Georges N.; and Morelle, Claude, to U.S. Philips Corporation. Test plate having a thermal test pattern. 4,549,814, Cl. 374-2.000.
Crosby Group, Inc., The: *See*—
Springer, Richard E.; and Baxter, Gary R., 4,549,829, Cl. 403-57.000.
Crossonneau, Denis, to Compagnie Industrielle de Mecanismes. Composite structure and in particular a slide for a window raiser of an automobile vehicle. 4,549,771, Cl. 308-3.00R.
Crouch, E. Donald, Jr.: *See*—
Stanescu, Mircea S.; and Crouch, E. Donald, Jr., 4,549,911, Cl. 148-16.000.
Crowley, George C.; Carlson, Gordon S.; and Woznicki, Michael, to Sunbeam Corporation. Protective circuit for portable electric appliances. 4,550,358, Cl. 361-42.000.
Cselt - Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See*—
Belforte, Piero; Garetti, Enzo; and Pilati, Luciano, 4,550,398, Cl. 370-66.000.
Culbertson, Townley P.: *See*—
Mich, Thomas F.; and Culbertson, Townley P., 4,550,103, Cl. 514-210.000.
Cushing, Nelson N., to Caldwell, Theresa. Soil sampler. 4,549,612, Cl. 175-20.000.
Cyphelly, Ivan-Jaroslav: *See*—
Stich, Bodo; Hassler, Ernst; and Cyphelly, Ivan-Jaroslav, 4,549,862, Cl. 418-133.000.
Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Tachibana, Eiichi; Murayama, Koushou; and Isumi, Kenzo, 4,549,923, Cl. 156-423.000.
Dai, Shenghong A.; Grossman, Steven J.; and Onder, Kemal, to Dow Chemical Company, The. Polyamide block copolymer from lactam and azetidine-2,4-dione. 4,550,157, Cl. 528-322.000.
Daimler-Benz Aktiengesellschaft: *See*—
Burk, Gerhard; and Rau, Wolfgang, 4,549,762, Cl. 296-208.000.
Daiwa Seiko, Inc.: *See*—
Atobe, Takashi, 4,549,703, Cl. 242-84.52B.
Dallatomasina, Franco; Ortica, Roberto; Giardino, Pietro; and Oppici, Ernesto, to Farmitalia Carlo Erba S.p.A. Aspartame synthesis. 4,549,987, Cl. 260-112.50R.
Dalton, Jeffrey L.; and Johnson, Philip M., to Gentex Corporation. Method of forming a tintable abrasion-resistant coating on a substrate and article produced thereby. 4,550,059, Cl. 428-409.000.
D'Ambrosio, Anthony H. Garment waistband construction. 4,549,317, Cl. 2-237.000.
Damen, Theodoor C.; Duguay, Michael A.; Howard, Richard E.; Jackel, Lawrence D.; and Skocpol, William J., to AT&T Bell Laboratories. Optical disc read/write apparatus. 4,550,249, Cl. 250-201.000.
Dammann, Peter, to Barmag Barmer Maschinenfabrik AG. Yarn false twisting method and apparatus. 4,549,395, Cl. 57-340.000.
Dana Corporation: *See*—
Flotow, Richard A.; and Tennant, William M., 4,549,643, Cl. 192-111.00A.
Dana-Farber Cancer Institute, Inc.: *See*—
Reinherz, Ellis L.; Schlossman, Stuart F.; and Meuer, Stefan C., 4,550,086, Cl. 436-506.000.
Daniels, John Y.: *See*—
Hendrix, James E.; Daniels, John Y.; and White, Taryn M., 4,549,880, Cl. 8-115.520.
Dansk Industri Syndikat A/S: *See*—
Kauserud, Hakon, 4,549,600, Cl. 164-323.000.
Das, Jagabandhu; and Hall, Steven E., to E. R. Squibb & Sons, Inc. 7-Oxabicycloheptane substituted ethers and their use in treating thrombolytic disease. 4,550,120, Cl. 514-469.000.
Databar Corporation: *See*—
Winter, Arthur J.; and Larson, Rodney L., 4,550,247, Cl. 235-472.000.
Datta, Amitava: *See*—
Bose, Debasis; Datta, Amitava; and DeCristofaro, Nicholas J., 4,549,687, Cl. 228-263.180.
Daukas, Anthony, to General Dynamics Pomona Division. Torque optimizing neutral inertia device. 4,549,707, Cl. 244-3.210.
David, John C.; and Ryon, Ward E., to Fleischer Manufacturing, Inc. Attachment for removing residue in front of a planter. 4,550,122, Cl. 172-158.000.
Davis, James C., to Dow Chemical Company, The. Liquid chromatographic method and apparatus with membrane for post-column derivatization. 4,549,965, Cl. 210-635.000.
Davis, John, to Frymaster Corporation, The. Solid state temperature controller. 4,549,527, Cl. 126-374.000.
Davis, John E.; Zielke, Terry L.; and Coash, Ronald J. Corner watering system for center pivot irrigation machines. 4,549,694, Cl. 239-710.000.
De Beers Industrial Diamond Division (Proprietary) Limited: *See*—
Sexton, John S.; Stone, Brian J.; Howes, Trevor D.; and Andrew, Colin, 4,549,372, Cl. 51-206.00R.
De La Rue Systems Limited: *See*—
Tee, Victor G., 4,550,252, Cl. 250-223.00R.
de Boeve, Andre ; and de Boeve, Ronny. Cradle assembly adapted to be re-assembled into a bed stead for adults. 4,549,322, Cl. 5-93.00B.
de Boeve, Ronny: *See*—
de Boeve, Andre ; and de Boeve, Ronny, 4,549,322, Cl. 5-93.00B.
Debus, Walter, Jr., to AT&T Bell Laboratories. Fractionally spaced equalization using nyquist-rate coefficient updating. 4,550,415, Cl. 375-14.000.
DeCoene, Frans J. G. C., to Sperry Corporation. Round baler with expanding bale chamber. 4,549,480, Cl. 100-88.000.
DeCristofaro, Nicholas J.: *See*—
Bose, Debasis; Datta, Amitava; and DeCristofaro, Nicholas J., 4,549,687, Cl. 228-263.180.
Dee, Gerald M.; and Catrambone, Frank A., to Pneumatic Scale Corporation. Electronic control system for a weighing scale. 4,549,620, Cl. 177-60.000.
Deere & Company: *See*—
Halabiya, Sabah, 4,549,564, Cl. 137-110.000.
Herr, Herbert W.; Moon, Seaton; and Hopper, James E., 4,549,744, Cl. 280-415.00A.
Hoch, John J., 4,549,765, Cl. 297-311.000.
Huckler, Volker; Sonns, Eugen; Schafer, Helmut; and Nobis, Dieter, 4,549,637, Cl. 192-3.630.
Kittle, Carl E., 4,549,448, Cl. 74-710.500.
Kugler, Uwe H., 4,549,577, Cl. 137-614.040.
Kurt, Lynn E., 4,549,429, Cl. 73-40.000.
Tindall, Gary W., 4,549,625, Cl. 180-90.000.
Degnan, Thomas F.; and Farcasiu, Malvina, to Mobil Oil Corporation. Regeneration of ZSM-5 type catalyst with a source of alkali or alkaline earth metal cations or ammonia. 4,550,090, Cl. 502-25.000.
Degussa Aktiengesellschaft: *See*—
Karrenbauer, Michael; Kleemann, Axel; Lussling, Theodor; and Schafer, Fritz, 4,550,199, Cl. 562-556.000.
Karrenbauer, Michael; Kleemann, Axel; Lussling, Theodor; and Schafer, Fritz, 4,550,200, Cl. 562-556.000.
Deis, Jerome E., to Warner & Swasey Company, The. Method of making coordinate measurements. 4,550,418, Cl. 377-17.000.
Deligny, Jean, to Societe Anonyme DBA. Device for attaching to a wall the end of a sheath in which a control cable is slidably received. 4,549,709, Cl. 248-56.000.
Dessauer, Guido, to Feldmuhle Aktiengesellschaft. Uncoated paper web for printing and method for making and using same. 4,549,930, Cl. 162-134.000.
Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co., Ltd. Integral and a differential waveshape generator for an electronic musical instrument. 4,549,459, Cl. 84-1.010.
Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V.: *See*—
Otto, Gunther; and Warmbold, Gert, 4,550,420, Cl. 378-171.000.
Deutsche Texaco Aktiengesellschaft: *See*—
Volz, Hartwig; and Willmann, Egon, 4,549,813, Cl. 366-160.000.
Devro, Inc.: *See*—
Ziolko, Francis J., 4,549,330, Cl. 17-34.000.
Dewaegheneire, Gabriel, to Leuven Research & Development. Heat responsive valve. 4,549,717, Cl. 251-111.000.
Dexter, Steve: *See*—
Miller, Richard W.; Nagao, Jay; and Dexter, Steve, 4,549,449, Cl. 74-785.000.
Dianitsch, Franz, to Optyl Eyewear Fashion International Corporation. Adjustable nose piece and incorporating sunglasses. 4,549,792, Cl. 351-63.000.
Dieckhoff, Rolf. Apparatus having a picture screen for the display of picture sequences. 4,549,798, Cl. 353-72.000.
Diehlmann, Rolf: *See*—
Bellemann, Rudolf; Diehlmann, Rolf; Dobrocsi, Bela; and Wacker, Karl F., 4,549,961, Cl. 210-108.000.
Dienst, Manfred: *See*—
Uhland, Eberhard; Dienst, Manfred; and Wente, Claus-Heinrich, 4,550,002, Cl. 264-40.100.
Diesel Kiki Company, Ltd.: *See*—
Ishizuka, Yutaka; and Shibuya, Tsunenori, 4,549,855, Cl. 417-270.000.
Director-General of Agency of Industrial Science and Technology: *See*—
Kishi, Yoshiki; Hirotani, Toyotoshi; Ohira, Tomohiro; and Fukui, Yukio, 4,550,294, Cl. 332-7.510.
Dischert, Robert A.; Moles, Warren H.; Rhodes, Roland N.; and Walter, James M., to RCA Corporation. Digital video transmission system. 4,550,337, Cl. 358-13.000.
Display Interface Corp.: *See*—
Whetstone, Albert L.; and Shaklee, Kerry L., 4,550,316, Cl. 340-710.000.
Disteldorf, Josef; Hubel, Werner; and Reiffer, Johannes, to Chemische Werke Huls Aktiengesellschaft. Process for continuous hot phosgenation of amines. 4,549,991, Cl. 260-453.0PH.
Disteldorf, Walter; Eisfeld, Wolfgang; and Kohler, Rolf-Dieter, to BASF Aktiengesellschaft. Preparation of 4,4'-diaminobenzophenones. 4,550,208, Cl. 564-329.000.

Dittakavi, Ashok, to Texas Instruments Incorporated. Electronic learning aid with random number modes. 4,549,867, Cl. 434-337.000.

Dittrich, Hans: *See*—
Ernst, Gunter; Baer, Edmund; Wurz, Dieter; and Dittrich, Hans, 4,549,999, Cl. 261-109.000.

Dixon, Angus B., to General Electric Company, p.l.c., The. Electric discharge lamps. 4,550,269, Cl. 313-331.000.

Djugovskaya, Larisa A.: *See*—
Gjulling, Eduard V.; Djugovskaya, Larisa A.; Zabolotny, Dmitry I.; Kovtun, Jury P.; Liptuga, Nikolai I.; Litus, Viktor I.; Sambur, Marina B.; Romanov, Nikolai N.; Tolmachev, Alexei I.; Kirsanov, Alexandr V.; Pisanko, Viktor N.; Melnikov, Oleg F.; and Klochkov, Evgeny I., 4,550,170, Cl. 548-154.000.

Dobler, Klaus; Heinz, Rudolf; Schoor, Ulrich; and Frey, Thomas, to Robert Bosch GmbH. Sensor. 4,549,430, Cl. 73-115.000.

Dobrocsi, Bela: *See*—
Bellemann, Rudolf; Diehlmann, Rolf; Dobrocsi, Bela; and Wacker, Karl F., 4,549,961, Cl. 210-108.000.

Dockner, Toni; Kempe, Uwe; and Frank, Anton, to BASF Aktiengesellschaft. Preparation of imidazole-4,5-dicarboxylic acid. 4,550,176, Cl. 548-343.000.

Dr. Johannes Heidenhain GmbH: *See*—
Affa, Alfred; and Ernst, Alfons, 4,549,354, Cl. 33-125.00T.
Ernst, Alfons, 4,549,808, Cl. 356-374.000.

Dr. Karl Thomae GmbH: *See*—
Engel, Wolfhard; Trummlitz, Gunter; Eberlein, Wolfgang; Mihm, Gerhard; Schmidt, Gunther; Hammer, Rudolf; and Giachetti, Antonio, 4,550,107, Cl. 514-220.000.

Dolbeau, Michel: *See*—
Auberon, Marcel; Cabanel, Daniel; Dolbeau, Michel; Phan, Albert; Pillois, Philippe; Bournazel, Claude L.; and Huvey, Michel, 4,549,919, Cl. 156-172.000.

Doljack, Frank A.: *See*—
McTavish, Mary S.; Stodieck, Robert W.; and Doljack, Frank A., 4,550,301, Cl. 338-20.000.

Dolomitwerke GmbH: *See*—
Wyskott, Bernd; Prange, Rainer; Moller, Kurt; and Fleischer, Joachim, 4,549,906, Cl. 106-16.000.

Doman, Herbert M., to Everest & Jennings, Inc. Wheelchair direction control means. 4,549,624, Cl. 180-6.280.

Domnanovich, James R.: *See*—
Groch, Mark W.; and Domnanovich, James R., 4,549,552, Cl. 128-700.000.

Donaldson Company, Inc.: *See*—
Engel, Mark R., 4,549,715, Cl. 251-29.000.

Donaldson, William B. M. Method for protection of the eye. 4,549,539, Cl. 128-132.00R.

Doswald, Paul; Moriconi, Emil; Moser, Helmut; and Schmid, Horst, to Sandoz Ltd. Metal-free disazo compounds containing at least two basic water-solubilizing groups and having a 1-phenylpyrazole middle component radical and a 6-hydroxyprid-2-one terminal coupling component. 4,550,158, Cl. 534-605.000.

Douaud, Andre ; and Rialan, Joseph, to Institut Francais Du Petrole. Method for the automatic adjustment of the ignition initiation control time in an internal combustion engine. 4,549,513, Cl. 123-425.000.

Dougherty, John J., to General Electric Company. Circuit breaker static trip unit having automatic circuit trimming. 4,550,360, Cl. 361-93.000.

Douglas, Eric C.: *See*—
Prince, Dennis; and Douglas, Eric C., 4,549,710, Cl. 248-183.000.

Douillard, Roger. Urinal. 4,549,321, Cl. 4-301.000.

Dow Chemical Company, The: *See*—
Dai, Shenghong A.; Grossman, Steven J.; and Onder, Kemal, 4,550,157, Cl. 528-322.000.
Davis, James C., 4,549,965, Cl. 210-635.000.
Frulla, Floro F.; Stuber, Fred A.; and Whitman, Peter J., 4,550,188, Cl. 560-24.000.
Rogers, Richard B.; and Gerwick, B. Clifford, III, 4,550,192, Cl. 560-62.000.
Yats, Larry D., 4,550,131, Cl. 524-35.000.

Dow Corning Corporation: *See*—
Chandra, Grish; Kosal, Jeffrey A.; Petroff, Lenin J.; and Pluedemann, Edwin P., 4,549,979, Cl. 252-135.000.
Lee, Chi-Long; Maxson, Myron T.; and Rabe, James A., 4,550,125, Cl. 521-117.000.

Dowbenko, Rostyslaw; and Greigger, Barbara A., to PPG Industries, Inc. Lactam derived salts of sulfonic acids as latent acid catalysts. 4,550,137, Cl. 525-31.000.

Dowe Egberts Koninklijke Tabaksfabriek-Koffiebranderijen-Theehandel N.V.: *See*—
le Gramse, Josephus N., 4,550,024, Cl. 426-77.000.

Doyle, Stephen D.: *See*—
Bulso, Joseph D., Jr.; Doyle, Stephen D.; and McClung, James A., 4,549,424, Cl. 72-329.000.

Drabek, Jozef: *See*—
Boger, Manfred; and Drabek, Jozef, 4,550,108, Cl. 514-232.000.

Drake, Charles A., to Phillips Petroleum Company. Catalyst for the production of allyl acetate. 4,550,097, Cl. 502-170.000.

Dredging International: *See*—
Van Hove, Emile, 4,549,497, Cl. 114-36.000.

Driscoll, John N.; and Atwood, Edwards S., to HNU Systems, Inc. Ion-selective electrodes. 4,549,953, Cl. 204-419.000.

Driscoll, Michael M., to United States of America, Air Force. Narrow deviation voltage controlled crystal oscillator. 4,550,293, Cl. 331-116.00R.

Droescher, Michael; Burzin, Klaus; Gerth, Christian; and Heuer, Horst, to Chemische Werke Huels Aktiengesellschaft. Molding compositions based on high molecular weight polyalkylene terephthalates. 4,550,148, Cl. 525-440.000.

Drope, Terrence H.: *See*—
Weller, Ronald W.; and Drope, Terrence H., 4,549,730, Cl. 271-100.000.

Duguay, Michael A.: *See*—
Damen, Theodoor C.; Duguay, Michael A.; Howard, Richard E.; Jackel, Lawrence D.; and Skocpol, William J., 4,550,249, Cl. 250-201.000.

Duke University: *See*—
McPhail, Andrew T.; Spielvogel, Bernard F.; and Hall, Iris H., 4,550,186, Cl. 556-8.000.

Dullabaun, Paul W., to Owens-Illinois, Inc. Tamper indicating package. 4,549,667, Cl. 215-252.000.

Duncan, Charles W.; and Murray, David G., to Waco International Corporation. Scaffold connector assembly. 4,549,634, Cl. 182-179.000.

Dunn, Edward G., Jr.; and Dunn, Edward G., Sr. Side rail for outdoor bumper pool table. 4,549,735, Cl. 273-9.000.

Dunn, Edward G., Sr.: *See*—
Dunn, Edward G., Jr.; and Dunn, Edward G., Sr., 4,549,735, Cl. 273-9.000.

Duphar International Research B.V.: *See*—
Brouwer, Marius S.; and Grosscurt, Arnoldus C., 4,550,202, Cl. 564-23.000.
Paerels, Gerard B.; and Raven, Cornelis W., 4,550,205, Cl. 564-166.000.

Du Pont de Nemours, E. I., and Company: *See*—
Capriotti, Dante R., 4,550,132, Cl. 524-84.000.
Forsythe, Jesse G., Jr.; and Stafford, Sally S., 4,549,655, Cl. 206-569.000.
Hoh, George L., 4,550,141, Cl. 525-221.000.
Mabry, Melinda A.; Prichard, William W.; and Ziemecki, Stanislaw B., 4,550,185, Cl. 549-508.000.
Neiss, Melvin A.; and Woodruff, Robert W., 4,550,073, Cl. 430-273.000.
Wolfe, William R., Jr., 4,549,921, Cl. 156-272.600.

Dyck, Walter R.; and Eirich, Ronald A., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defense. Heart rate detector. 4,549,551, Cl. 128-689.000.

Dynamit Nobel Aktiengesellschaft: *See*—
Spielau, Paul; Fassbender, Helmut; and Weiss, Richard, 4,550,051, Cl. 428-285.000.

Dysan Corporation: *See*—
Larson, Bert R.; and Wartenbergh, Robert P., 4,550,355, Cl. 360-133.000.

E. F. Johnson Company: *See*—
Swinehart, Frank, 4,550,361, Cl. 361-295.000.

E. Frohlich AG: *See*—
Stahli, Peter, 4,549,333, Cl. 28-205.000.

E. R. Squibb & Sons, Inc.: *See*—
Das, Jagabandhu; and Hall, Steven E., 4,550,120, Cl. 514-469.000.

Early, Judson H.: *See*—
Off, Joseph W. A.; and Early, Judson H., 4,549,916, Cl. 156-93.000.

Early, Victor. Portable folding hunting stand. 4,549,635, Cl. 182-187.000.

Eastman Kodak Company: *See*—
Columbus, Richard L., 4,549,952, Cl. 204-416.000.
Lehmann, Robert P.; and Vianco, James E., 4,550,396, Cl. 369-284.000.

Eberlein, Wolfgang: *See*—
Engel, Wolfhard; Trummlitz, Gunter; Eberlein, Wolfgang; Mihm, Gerhard; Schmidt, Gunther; Hammer, Rudolf; and Giachetti, Antonio, 4,550,107, Cl. 514-220.000.

Ebner, Anneliese; and Kranauer, Erwin. Cooling device for vehicle interiors. 4,549,406, Cl. 62-241.000.

Edmondson, Richard: *See*—
Wisebaker, Robert E.; and Edmondson, Richard, 4,549,425, Cl. 72-422.000.

Edwards, Roy E.: *See*—
Price, Anthony G.; and Edwards, Roy E., 4,549,636, Cl. 188-71.400.

Efcor, Inc.: *See*—
Kot, Vincent; Wallis, Bruce; and Robinson, Alfred, 4,549,755, Cl. 285-341.000.

Effenberger, Ranko F. F. Apparatus for grinding and lapping annular sealing faces. 4,549,373, Cl. 51-241.00A.

Ehrhart, Raymond G.: *See*—
Gasper, Kenneth E.; and Ehrhart, Raymond G., 4,549,853, Cl. 417-53.000.

Ehrlinger, Klaus: *See*—
Kruger, Roland; and Ehrlinger, Klaus, 4,550,029, Cl. 426-487.000.

Ehrlinger, Wolfgang; Hirsch, Gerhard; and Alberty, Michael, to ANT Nachrichtentechnik GmbH. Waveguide-microstrip transition arrangement. 4,550,296, Cl. 333-26.000.

Eirich, Ronald A.: *See*—
Dyck, Walter R.; and Eirich, Ronald A., 4,549,551, Cl. 128-689.000.

Eisfeld, Wolfgang: *See*—
Disteldorf, Walter; Eisfeld, Wolfgang; and Kohler, Rolf-Dieter, 4,550,208, Cl. 564-329.000.

Ek, Kenneth; and Hammarstedt, Ulf. Method for collecting and separating solids and/or insoluble liquids from a liquid body. 4,549,970, Cl. 210-776.000.

Elbe, Hans-Ludwig: *See*—
Kramer, Wolfgang; Buchel, Karl H.; Elbe, Hans-Ludwig; Krastz, Udo; Regel, Erik; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Lurssen, Klaus, 4,549,900, Cl. 71-92.000.
Electric Power Research Institute, Inc.: *See*—
Gupta, Tapan K.; Carlson, William G.; Osterhout, Joseph C.; Boyette, Gerald B.; and Sweetana, Andrew S., Jr., 4,549,981, Cl. 252-518.000.
Electro-Nucleonics, Inc.: *See*—
Woodbridge, J. Eliot; Bulbenko, George F.; and Marshall, J. John, 4,550,077, Cl. 435-22.000.
Electrochem International, Inc.: *See*—
Horn, Richard E., 4,549,946, Cl. 204-182.400.
Elin Union AG: *See*—
Felber, Willibald, 4,549,817, Cl. 374-152.000.
Elkem a/s: *See*—
Hyggen, Egil E., 4,549,591, Cl. 152-218.000.
Elliott, Henry H., to General Electric Company. Waste disposal process. 4,549,985, Cl. 252-631.000.
Ellis, Charles S.: *See*—
Bolin, Philip C.; Bowman, Gary K.; Ellis, Charles S.; Hopkins, Melvyn D.; and Kane, Richard E., 4,550,219, Cl. 174-21.00C.
Elmaraghy, Rachik; and Fontaine, Michel, to Centre de Recherche Industrielle du Quebec. Noise damping guard for circular saws. 4,549,456, Cl. 83-478.000.
Elzer, Albert: *See*—
Lynch, John; and Elzer, Albert, 4,550,072, Cl. 430-256.000.
Emerson, Hartley T. Self mixing funnel. 4,549,585, Cl. 141-95.000.
Ender, Hans G. Splint for reducing and maintaining motionless fractures of fingers and the metacarpus and process for producing such a splint. 4,549,537, Cl. 128-87.00A.
Endo, Mitsushi; Taniguchi, Toshiaki; Sahara, Teruyoshi; Hayakawa, Noriyuki; Yoshitomi, Tatsuo; Takahashi, Kozo; Nagatani, Yoshiteru; Kawai, Hidenao; Kaizyo, Shuichi; Nakagawa, Yoichi; Yamagami, Kazuo; Takizawa, Teruo; and Suzuki, Tomio, to Hitachi Ltd.; and Hitachi Plant Engineering & Construction Co. Rearrangeable partial environmental control device. 4,549,472, Cl. 98-34.600.
Engel, Mark R., to Donaldson Company, Inc. Apparatus for providing a gaseous pressure pulse. 4,549,715, Cl. 251-29.000.
Engel, Thomas G.: *See*—
Goetz, William J.; and Engel, Thomas G., 4,549,932, Cl. 162-207.000.
Engel, Wolfhard; Trummlitz, Gunter; Eberlein, Wolfgang; Mihm, Gerhard; Schmidt, Gunther; Hammer, Rudolf; and Giachetti, Antonio, to Dr. Karl Thomae GmbH. Condensed diazepinones, their compositions and methods of use as pharmaceuticals. 4,550,107, Cl. 514-220.000.
Engelhard Corporation: *See*—
Shimrock, Thomas; Taylor, R. Dirk; and Collins, John M., Jr., 4,550,034, Cl. 427-243.000.
English, Raymond; and Towle, Michael, to Globe Manufacturing Co. Fireman's bib overall. 4,549,315, Cl. 2-2.000.
Engtech SA: *See*—
Kaalstad, Oscar W.; and Reid, Neil G., 4,549,614, Cl. 175-339.000.
Enomoto, Seiji: *See*—
Kabashima, Katsuhiko; Takemae, Yoshihiro; Nozaki, Shigeki; Ohira, Tsuyoshi; Miyahara, Hatsuo; Kansi, Masakazu; and Enomoto, Seiji, 4,550,289, Cl. 324-158.00R.
Enso-Gutzeit Oy: *See*—
Vikio, Pentti, 4,549,964, Cl. 210-369.000.
Entes, Peter C., to Smiths Food Group B.V. Apparatus for washing slices of a tuberous plant. 4,549,478, Cl. 99-536.000.
Envirex Inc.: *See*—
Koelsch, Lester M., 4,549,962, Cl. 210-150.000.
Erickson, Charles D., to Smith Meter, Inc. Compact flow prover. 4,549,426, Cl. 73-3.000.
Erickson, James L. Combined distillation apparatus and hot liquid system. 4,549,936, Cl. 202-167.000.
Ernst, Alfons, to Johannes Heidenhain GmbH. Sealing arrangement for multicoordinate sensing head. 4,549,356, Cl. 33-169.00R.
Ernst, Alfons, to Dr. Johannes Heidenhain GmbH. Movable aperture photoelectric measuring instrument. 4,549,808, Cl. 356-374.000.
Ernst, Alfons: *See*—
Affa, Alfred; and Ernst, Alfons, 4,549,354, Cl. 33-125.00T.
Ernst, Gunter; Baer, Edmund; Wurz, Dieter; and Dittrich, Hans, to Ernst, Gunter. Cooling tower. 4,549,999, Cl. 261-109.000.
Ernst, Hansgeorg; Gehrken, Henning-Peter; and Paust, Joachim, to BASF Aktiengesellschaft. Preparation of α-tocopherol. 4,550,182, Cl. 549-408.000.
Erpenbach, Heinz; Gehrmann, Klaus; Horstermann, Peter; Kubbeler, Hans-Klaus; and Kohl, Georg, to Hoechst Aktiengesellschaft. Process for separating the catalyst system from the reaction mixtures of carbonylation reactions. 4,549,937, Cl. 203-40.000.
Esau, Edward W., to Hesston Corporation. Cylinder mounting apparatus for hydraulic squeeze control in a crop baler. 4,549,482, Cl. 100-191.000.
Espinoza, H. Cesar, to Hollingsead International, Inc. Rack assembly for plug-in modules. 4,549,602, Cl. 165-80.200.
Essex Group, Inc.: *See*—
Lavallee, Francois A., 4,550,055, Cl. 428-383.000.
Ethicon Inc.: *See*—
Levy, Alan J., 4,549,545, Cl. 128-335.000.
Roshdy, Constance E., 4,549,649, Cl. 206-63.300.
Ethyl Corporation: *See*—
Kirsch, Warren B., 4,549,973, Cl. 252-8.55R.
Knapp, Gordon G., 4,549,882, Cl. 44-53.000.
Knapp, Gordon G., 4,549,885, Cl. 44-57.000.
Ramachandran, Venkataraman, 4,550,167, Cl. 546-156.000.
Etschenberg, Eugen: *See*—
Welter, Andre ; Leyck, Sigurd; and Etschenberg, Eugen, 4,550,168, Cl. 546-270.000.
Etudes Techniques et Representations Industrielles E.T.R.I.: *See*—
Vettori, Claude; and Chauviere, Henri, 4,549,858, Cl. 417-353.000.
Eue, Ludwig: *See*—
Forster, Heinz; Klauke, Erich; Eue, Ludwig; Schmidt, Robert R.; and Lurssen, Klaus, 4,549,899, Cl. 71-90.000.
Evans, Elfed H.; Hirte, Klaus; and Stremmel, Gerd, to Lever Brothers Company. Process for manufacture of detergent powder. 4,549,978, Cl. 252-109.000.
Evans Products Company: *See*—
Gaines, Donald R.; and Gaines, Donald L., 4,549,504, Cl. 123-41.010.
Evans, Ronald M.; and Rosenfeld, Michael G., to Salk Institute for Biological Studies, The. Human CGRP. 4,549,986, Cl. 260-112.50T.
Everest & Jennings, Inc.: *See*—
Doman, Herbert M., 4,549,624, Cl. 180-6.280.
Everett/Charles Test Equipment, Inc.: *See*—
Neal, Thomas M., 4,550,406, Cl. 371-20.000.
Evers, William J.; Mookherjee, Braja D.; Van Ouwerkerk, Anton; and Van Loveren, Augustinus G., to International Flavors & Fragrances Inc. 1,2,3,3,5,6-Hexamethyl-bicyclo[2.2.2]oct-5-en-2-ol, process for producing same, intermediates useful in said process and organoleptic uses of same. 4,549,972, Cl. 252-8.600.
Excell Corporation: *See*—
Shimizu, Shoji, 4,550,008, Cl. 264-527.000.
Exploration Logging, Inc.: *See*—
Mumby, Edward S., 4,550,392, Cl. 367-82.000.
Exxon Production Research Co.: *See*—
Hibbs, David A.; Rickey, Wynn P.; and Stanton, Paul N., 4,549,578, Cl. 137-624.110.
Eyerly, Joyce K.: *See*—
Schadrack, William C., III; McQueen, Robert W.; and Eyerly, Joyce K., 4,549,538, Cl. 128-92.0EB.
F. N. Burt Company, Inc.: *See*—
Rosenburg, Charles W., 4,549,690, Cl. 229-41.00C.
Fabrication Center, Inc.: *See*—
Kile, H. Buford, 4,549,496, Cl. 112-79.500.
Fabriques D'horlogerie De Fontainemelon S.A.: *See*—
Klein, Eric, 4,550,279, Cl. 318-696.000.
Fairchild Camera and Instrument Corporation: *See*—
West, Burnell G., 4,550,405, Cl. 371-1.000.
Fairchild, Raymond S.: *See*—
Tay, Ching-Hua; and Fairchild, Raymond S., 4,549,929, Cl. 162-78.000.
Fairfield Manufacturing Company: *See*—
Miller, Richard W.; Nagao, Jay; and Dexter, Steve, 4,549,449, Cl. 74-785.000.
Faltynek, Robert A., to General Electric Company. Nickel complex catalyst for hydrosilation reactions. 4,550,152, Cl. 528-15.000.
Fanelli, Anthony J.; and Price, Alson K., to Allied Corporation. Alumina-based aerogel supported transition metal catalyst useful as a Ziegler-Natta olefin polymerization catalyst and process for preparing same. 4,550,093, Cl. 502-107.000.
Fannin, Richard C., to Allied Corporation. Automatic control for an external air supply. 4,549,888, Cl. 55-163.000.
Fanuc Ltd: *See*—
Nozawa, Ryoichiro; Nagamine, Tsuyoshi; and Shima, Atsushi, 4,550,378, Cl. 364-474.000.
Torii, Nobutoshi; and Nihei, Ryo, 4,549,846, Cl. 414-729.000.
Farcasiu, Malvina: *See*—
Degnan, Thomas F.; and Farcasiu, Malvina, 4,550,090, Cl. 502-25.000.
Farge, Daniel; Leger, Andre ; and Ponsinet, Gerard, to Rhone-Poulenc Sante. 6-(1,8-Naphthyridin-2-yl)-dithiino[1,4][2,3-c]-pyrroles useful as tranquillizers and anticonvulsants. 4,550,110, Cl. 514-254.000.
Farmitalia Carlo Erba S.p.A.: *See*—
Dallatomasina, Franco; Ortica, Roberto; Giardino, Pietro; and Oppici, Ernesto, 4,549,987, Cl. 260-112.50R.
Farrell, Geoffrey, to Burroughs Wellcome Co. Perfume dispenser. 4,549,996, Cl. 261-19.000.
Fassbender, Helmut: *See*—
Spielau, Paul; Fassbender, Helmut; and Weiss, Richard, 4,550,051, Cl. 428-285.000.
Fassler, Michael H.: *See*—
Reiner, Martin J.; and Fassler, Michael H., 4,549,399, Cl. 164-122.100.
Favaron, James A., to Senmed, Inc. Clip stop for a surgical ligating instrument. 4,549,544, Cl. 128-335.000.
Fay, William A., III, to Harsco Corporation. Flush mounted hinge assembly having a floating link. 4,549,671, Cl. 220-344.000.
Federico, Anthony M.; Legg, Ernest L.; Wiiczek, Stephen P.; Prasad, Hari K.; and Petery, James J., to Xerox Corporation. Filtered inputs. 4,550,382, Cl. 364-572.000.
Feenstra, Randall M.: *See*—
Binnig, Gerd K.; Feenstra, Randall M.; Hodgson, Rodney T.; Rohrer, Heinrich; and Woodall, Jerry M., 4,550,257, Cl. 250-492.200.
Felber, Willibald, to Elin Union AG. Thermal monitoring apparatus for transformers or chokes. 4,549,817, Cl. 374-152.000.
Felcht, Utz-Hellmuth; and Buchberger, Gerhard, to Hoechst Aktiengesellschaft. Preparing water-soluble mixed cellulose ethers. 4,550,161, Cl. 536-90.000.

Feldmuhle Aktiengesellschaft: *See*—
Dessauer, Guido, 4,549,930, Cl. 162-134.000.
Fender Musical Instruments Corporation: *See*—
Gressett, Charles A., Jr.; and Smith, Daniel J., 4,549,460, Cl. 84-298.000.
Fergus, George H.: *See*—
Gillig, Steven F.; Fergus, George H.; and Barnes, Michael F., 4,550,426, Cl. 381-46.000.
Ferns, Derek, to Selflevel Covers (Jersey) Limited. Frame members for supporting covers or gratings. 4,549,833, Cl. 404-4.000.
Fey, Michael; Finkelstein, Wolfgang; Haaz, Josef; and Riegel, Hans, to Gebruder Trox Gesellschaft mit beschrankter Haftung. Air conditioner outlet. 4,549,474, Cl. 98-120.000.
Fiberglas Canada Inc.: *See*—
Kucharska, Helena Z.; and Burton, Thomas M., 4,550,124, Cl. 521-85.000.
Fiberlok, Inc.: *See*—
Buck, George S., Jr., 4,550,050, Cl. 428-283.000.
Figgie International, Inc.: *See*—
Rosenberg, Isadore; and Ansite, William K., 4,550,044, Cl. 428-101.000.
Finkelstein, Wolfgang: *See*—
Fey, Michael; Finkelstein, Wolfgang; Haaz, Josef; and Riegel, Hans, 4,549,474, Cl. 98-120.000.
Finney, Roy P., to Medical Engineering Corporation. Male urinary incontinence device and method. 4,549,530, Cl. 128-1.00R.
Fischer, Wolfgang; Seitz, Georg; and Krenn, Karl-Dieter, to Merck Patent Gesellschaft mit beschrankter Haftung. Karl-Fischer reagent and procedure for the determination of water using it. 4,550,083, Cl. 436-42.000.
Fish, Russell, III; and Yurchenco, James R., to Post Technologies, Inc. Thermal printer for a low cost electronic mail terminal. 4,549,825, Cl. 400-692.000.
Fisher, Denys, to Waddingtons Games Limited. Movable mosaics. 4,550,040, Cl. 428-33.000.
Flamig, Peter, to Protechna Herbst GmbH & Co. KG. Device for the photoelectric supervision of a warp loom. 4,549,413, Cl. 66-163.000.
Fleischer, Joachim: *See*—
Wyskott, Bernd; Prange, Rainer; Moller, Kurt; and Fleischer, Joachim, 4,549,906, Cl. 106-16.000.
Fleischer Manufacturing, Inc.: *See*—
David, John C.; and Ryon, Ward E., 4,550,122, Cl. 172-158.000.
Fling, Russell T., to RCA Corporation. Binary divider as for a digital auto flesh circuit. 4,550,339, Cl. 358-28.000.
Flotow, Richard A.; and Tennant, William M., to Dana Corporation. Self adjusting device for a friction clutch. 4,549,643, Cl. 192-111.00A.
Flynn Burner Corporation: *See*—
Granville, Clive W., 4,549,866, Cl. 432-10.000.
Foch, Henri; and Roux, Jacques, to Agence Nationale pour la Valorisation et la Recherche. Static semi-conductor electrical energy converter apparatus. 4,550,365, Cl. 363-98.000.
Focus Environmental Systems: *See*—
Gibson, George W., 4,549,528, Cl. 126-438.000.
Fohl, Arthur, to Repa Feinstanzwerk GmbH. Safety belt roll-up device, especially for protecting persons in motor vehicles. 4,549,705, Cl. 242-107.40R.
Fohl, Artur, to Repa Feinstanzwerk GmbH. Coupling device for the winding shaft of a safety belt roll-up device with retightening device. 4,549,704, Cl. 242-107.000.
Fohl, Artur, to Repa Feinstanzwerk GmbH. Belt lock for a safety belt. 4,549,768, Cl. 297-468.000.
Fohlen, George M.: *See*—
Kumar, Devendra; Fohlen, George M.; and Parker, John A., 4,550,177, Cl. 548-413.000.
Foley, Daniel M., Jr., to Brail, Fred, a part interest. Drive-actuated latching device for a security parking gate. 4,549,369, Cl. 49-279.000.
Folkers, Karl; and Laesecke, Klaus P., to Board of Regents, The University of Texas System, The. Lipoidal biopterin compounds. 4,550,109, Cl. 514-249.000.
Fong, Chen S.: *See*—
Seng, Yeoh C.; and Fong, Chen S., 4,549,897, Cl. 71-3.000.
Fontaine, Michel: *See*—
Elmaraghy, Rachik; and Fontaine, Michel, 4,549,456, Cl. 83-478.000.
Ford Motor Company: *See*—
Gable, Melvin G.; Sherman, Richard H.; and Yuan, Fumin, 4,550,402, Cl. 370-85.000.
Holland, Scott B.; and Strachan, Bruce D., 4,550,286, Cl. 324-51.000.
Johnson, Milton D.; and Chattha, Mohinder S., 4,550,201, Cl. 564-15.000.
Kordomenos, Panagiotis I., 4,550,154, Cl. 528-73.000.
Fordonal, S.A.: *See*—
Soto, Jose M. P.; Noverola, Armando V.; Mauri, Jacinto M.; and Spickett, Robert G. W., 4,550,116, Cl. 514-327.000.
Forquer, William F., to Security Shutter Corp. Locking gear drive. 4,549,444, Cl. 74-411.500.
Fors, Lars B. S.: *See*—
Verner, Bo L.; and Fors, Lars B. S., 4,549,997, Cl. 261-77.000.
Forslund, Torsten E., to Osa AB. Method and an apparatus for crosscutting tree stems to pre-determined lengths. 4,549,588, Cl. 144-356.000.
Forster, Heinz; Klauke, Erich; Eue, Ludwig; Schmidt, Robert R.; and Lurssen, Klaus, to Bayer Aktiengesellschaft. Hericidally active novel substituted 3-trihalogenomethyl-1,2,4-thiadiazol-5-yl-oxyacetamides. 4,549,899, Cl. 71-90.000.
Forsythe, Jesse G., Jr.; and Stafford, Sally S., to Du Pont de Nemours, E. I., and Company. Container for a layered chemical analysis system. 4,549,655, Cl. 206-569.000.
Fory, Werner: *See*—
Bohner, Beat; Fory, Werner; Gass, Karl; and Meyer, Willy, 4,549,898, Cl. 71-90.000.
Foto, Anthony J.: *See*—
Carter, Donald F., 4,549,775, Cl. 312-15.000.
Fournier, Paul J. E.; and Rogers, Russell L., to Aeroquip Corporation. Fluid sampling valve. 4,549,440, Cl. 73-863.850.
Fowler, Alan B., to International Business Machines Corporation. Semiconductor interferometer. 4,550,330, Cl. 357-16.000.
Fowler, Aubrey A., Jr., to Walker, Joseph W.; and Southeastern Crane Fork. Forklift-type lifting apparatus. 4,549,759, Cl. 294-67.200.
Francois, Daniel: *See*—
Glachet, Charles; Francois, Daniel; Tentelier, Jean; and Frioux, Christian, 4,549,839, Cl. 414-7.000.
Frank, Anton: *See*—
Dockner, Toni; Kempe, Uwe; and Frank, Anton, 4,550,176, Cl. 548-343.000.
Fraser, Gregory A.; and Raab, Simon, to Orthothronics Limited Partnership. Knee laxity evaluator and motion module/digitizer arrangement. 4,549,555, Cl. 128-782.000.
Free, Michael J., to PIACT. IUD Package. 4,549,652, Cl. 206-363.000.
Freeburg, Thomas A., to Motorola, Inc. Method and apparatus for dynamically selecting transmitters for communications between a primary station and remote stations of a data communications system. 4,550,443, Cl. 455-33.000.
Freeman, Martin; and Levy, Leon S., to AT&T Bell Laboratories. Parallel text matching methods and apparatus. 4,550,436, Cl. 382-34 000.
Freeman, Tommie A., to Halliburton Company. Plug assembly for offshore platforms. 4,549,580, Cl. 138-89.000.
Freise, Werner, to Siemens Aktiengesellschaft. Motor/generator operating on the reluctance principle. 4,550,280, Cl. 318-701.000.
French Systems, Inc.: *See*—
Hindman, David B.; Gerlach, Lawrence L.; and Wallace, Bruce A., 4,549,893, Cl. 65-28.000.
Frequency West Inc.: *See*—
Harrison, William H., 4,550,297, Cl. 333-99.0MP.
Freudenreich, Herbert: *See*—
Ritschel, Peter; Freudenreich, Herbert; and Hartmann, Waldemar, 4,549,915, Cl. 156-78.000.
Frey, Thomas: *See*—
Dobler, Klaus; Heinz, Rudolf; Schoor, Ulrich; and Frey, Thomas, 4,549,430, Cl. 73-115.000.
Fried. Krupp Geselischaft mit beschrankter Haftung: *See*—
Langner, Alexander, 4,549,648, Cl. 198-509.000.
Frioux, Christian: *See*—
Glachet, Charles; Francois, Daniel; Tentelier, Jean; and Frioux, Christian, 4,549,839, Cl. 414-7.000.
Fritz Studer AG: *See*—
Renker, Hansjorg, 4,550,127, Cl. 523-212.000.
Frizzell, Leon A.: *See*—
Cain, Charles A.; and Frizzell, Leon A., 4,549,533, Cl. 128-24.00A.
Frohberger, Paul-Ernst: *See*—
Kramer, Wolfgang; Buchel, Karl H.; Elbe, Hans-Ludwig; Kraatz, Udo; Regel, Erik; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Lurssen, Klaus, 4,549,900, Cl. 71-92.000.
Frulla, Floro F.; Stuber, Fred A.; and Whitman, Peter J., to Dow Chemical Company, The. Preparation of carbamates. 4,550,188, Cl. 560-24.000.
Fryer, Rodney I.; Trybulski, Eugene J.; and Walser, Armin, to Hoffmann-La Roche Inc. 3H-2-Benzazepines. 4,549,988, Cl. 260-239.0BB.
Frymaster Corporation, The: *See*—
Davis, John, 4,549,527, Cl. 126-374.000.
Fuji Photo Film. Co., Ltd.: *See*—
Aono, Toshiaki; and Nakamura, Koichi, 4,550,071, Cl. 430-203.000.
Miyasaka, Tsutomu; Kobayashi, Hidetoshi; Itoh, Isamu; and Hirano, Shigeo, 4,550,070, Cl. 430-202.000.
Oishi, Kengo; and Suzuki, Osamu, 4,549,922, Cl. 156-293.000.
Sawano, Yukio; and Ono, Masaru, 4,549,797, Cl. 353-27.00A.
Fuji Xerox Co., Ltd.: *See*—
Tamai, Masayoshi, 4,550,322, Cl. 346-75.000.
Fujii, Setsuro: *See*—
Chikazawa, Nobumoto; Muraoka, Toshiharu; and Fujii, Setsuro, 4,550,076, Cl. 435-18.000.
Fujii, Toshinobu; and Kokado, Akira, to Meidensha Electric Mfg. Co., Ltd. Electrolyte circulation type metal-halogen secondary battery. 4,550,065, Cl. 429-105.000.
Fujikawa, Toyoharu: *See*—
Nishikubo, Yasuhiko; Fujikawa, Toyoharu; and Tanaka, Tsutomu, 4,549,818, Cl. 374-178.000.
Fujimoto, Hiroaki, to Yamaha Hatsudoki Kabushiki Kaisha; and Sanshin Kogyo Kabushiki Kaisha. Two-cycle internal combustion engine. 4,549,508, Cl. 123-73.0PP.
Fujinawa, Tomoaki: *See*—
Sugino, Toshiya; Nohara, Fujio; Fujinawa, Tomoaki; Ogawa, Kazuo; Mizukami, Teruo; and Shirai, Shunichi, 4,550,118, Cl. 514-383.000.
Fujioka, Koji, to Hoxan Corporation. Apparatus for measuring melting and boiling points of gas. 4,549,816, Cl. 374-27.000.
Fujisawa Pharmaceutical Co. Ltd.: *See*—
Teraji, Tsutomu; Sakane, Kazuo; and Goto, Jiro, 4,550,102, Cl. 514-206.000.

Fujita, Kazunori: *See*—
Horiba, Tatsuo; Fujita, Kazunori; Matsuda, Shinpei; and Tamura, Kohki, 4,550,067, Cl. 429-213.000.

Fujitsu Limited: *See*—
Hattori, Akira; and Tsuchimoto, Takamitsu, 4,550,367, Cl. 364-200.000.
Igarashi, Hiroshi, 4,550,290, Cl. 330-149.000.
Kabashima, Katsuhiko; Takemae, Yoshihiro; Nozaki, Shigeki; Ohira, Tsuyoshi; Miyahara, Hatsuo; Kanai, Masakazu; and Enomoto, Seiji, 4,550,289, Cl. 324-158.00R.
Takahaski, Hitoshi; Yamaguchi, Satoru; and Nunokawa, Hideo, 4,550,264, Cl. 307-264.000.
Yamaguchi, Hisashi; Asano, Toru; Takahara, Kazuhiro; Kurahashi, Keizo; and Andoh, Shizuo, 4,550,310, Cl. 340-365.00C.

Fujiwara, Atsushi, to Kabushiki Kaisha Ishida Koki Seisakusho. Combinatorial weighing apparatus. 4,549,619, Cl. 177-25.000.

Fujiwara, Hidetoshi; and Sato, Akihiko, to Toyoda Koki Kabushiki Kaisha. Flow volume control device for power steering system. 4,549,566, Cl. 137-117.000.

Fukazawa, Takeshi: *See*—
Yamaguchi, Shunzo; Atsumi, Morihiro; and Fukazawa, Takeshi, 4,549,905, Cl. 75-238.000.

Fukuda, Nobuo: *See*—
Shirai, Mitsuru; Fukuda, Nobuo; Yamamoto, Akira; and Tsuji, Hiroshi, 4,549,603, Cl. 165-104.330.

Fukui, Yukio: *See*—
Kishi, Yoshiki; Hirotani, Toyotoshi; Ohira, Tomohiro; and Fukui, Yukio, 4,550,294, Cl. 332-7.510.

Fukushima, Tadashi: *See*—
Kobayashi, Yoshiki; and Fukushima, Tadashi, 4,550,437, Cl. 382-41.000.

Fuller, Robert A.: *See*—
Morris, Jeffrey D.; and Fuller, Robert A., 4,550,149, Cl. 526-68.000.

Fuminier, Claude B., to Pont-A-Mousson S.A. Method and apparatus for separating a cut tube end. 4,549,678, Cl. 225-2.000.

Furuhashi, Hiroyuki: *See*—
Imai, Masafumi; Yamamoto, Tadashi; Furuhashi, Hiroyuki; Ueno, Hiroshi; and Inaba, Naomi, 4,550,095, Cl. 502-119.000.

Furukawa Electric Co., Ltd., The: *See*—
Unno, Yohei; Ueno, Satoru; Sadamitsu, Kazuo; and Okamoto, Tsuneo, 4,549,581, Cl. 138-109.000.

Furukawa, Toshio, to Sharp Kabushiki Kaisha. Electronic sphygmomanometer. 4,549,549, Cl. 128-680.000.

Fuwesi, Peter. Apparatus for restoring the surfaces surrounding the bores of metallic workpieces. 4,550,235, Cl. 219-76.140.

G-C Dental Industrial Corp.: *See*—
Ohi, Nobukazu; Ohno, Koji; and Kamohara, Hiroshi, 4,550,030, Cl. 427-2.000.

Ga-Vehren Engineering Company: *See*—
Hoffstetter, Armand C. L.; and Cason, Charles K., 4,549,729, Cl. 270-53.000.

Gable, Melvin G.; Sherman, Richard H.; and Yuan, Fumin, to Ford Motor Company. Data communication system. 4,550,402, Cl. 370-85.000.

Gabriel, Guy: *See*—
Bothorel, Pierre; Bernon, Roland; and Gabriel, Guy, 4,549,812, Cl. 366-142.000.

Gagliano, Victor. Jack adapter for cradle supporting of vehicle differentials and transmissions. 4,549,722, Cl. 254-134.000.

Gaines, Donald L.: *See*—
Gaines, Donald R.; and Gaines, Donald L., 4,549,504, Cl. 123-41.010.

Gaines, Donald R.; and Gaines, Donald L., to Evans Products Company. Electronic controller for regulating temperature within an internal combustion engine system. 4,549,504, Cl. 123-41.010.

Galasso, Francis S.; and Veltri, Richard D., to United Technologies Corporation. Silicon nitride reinforced nickel alloy composite materials. 4,550,063, Cl. 428-614.000.

Gallagher, Patrick E., to General Electric Company. Polyetherimide copolymers. 4,550,156, Cl. 528-185.000.

Galloway, John L.; Hankins, Timothy R. F.; and Owers, Ian A., to Racal Security Limited. Remote sensing systems. 4,550,311, Cl. 340-531.000.

Galloway, John L.; and Hankins, Timothy R. F., to Racal Security Limited. Remote sensing systems. 4,550,312, Cl. 340-539.000.

Gamblin, Rodger L., to Burlington Industries, Inc. Elongated fluid jet printing apparatus. 4,550,323, Cl. 346-75.000.

Ganseuer, Horst, to Siemag Transplan GmbH. Apparatus for cropping and inspecting a sheet-metal coil. 4,549,700, Cl. 242-56.00R.

Ganssle, Eugene R.; and Miller, Claude P., to RCA Corporation. Reflector antenna mounted in thermal distortion isolation. 4,550,319, Cl. 343-882.000.

Ganz, Robert H. Carton blank transfer mechanism. 4,549,731, Cl. 271-107.000.

GAO Gesellschaft fur Automation und Organisation GmbH: *See*—
Hoppe, Joachim; and Haghiri-Tehrani, Yahya, 4,550,248, Cl. 235-492.000.

Garabedian, Michael E.; and Roehrs, Robert E., to Alcon Laboratories, Inc. Tissue irrigating solution. 4,550,022, Cl. 424-127.000.

Garetti, Enzo: *See*—
Belforte, Piero; Garetti, Enzo; and Pilati, Luciano, 4,550,398, Cl. 370-66.000.

Garn, Incorporated: *See*—
Lunde, Martin R., 4,549,526, Cl. 126-367.000.

Garrett Corporation, The: *See*—
Kasabian, George, 4,549,341, Cl. 29-598.000.

Garrett, Lloyd W.: *See*—
Bowles, Patrick J.; and Garrett, Lloyd W., 4,549,644, Cl. 198-341.000.

Garwood, William E.; Kuo, James C.; Jacob, Solomon M.; and Wise, John J., to Mobil Oil Corporation. Conversion of coal to electricity. 4,549,396, Cl. 60-39.020.

Gasaway, John M.: *See*—
Collins, Patrick C.; and Gasaway, John M., 4,550,058, Cl. 428-412.000.

Gaskell, David J., to Lucas Industries, p.l.c. Fuel injection nozzles. 4,549,696, Cl. 239-452.000.

Gasper, Kenneth E.; and Ehrhart, Raymond G., to Olin Corporation. Positive displacement pump output monitor. 4,549,853, Cl. 417-53.000.

Gass, Karl: *See*—
Bohner, Beat; Fory, Werner; Gass, Karl; and Meyer, Willy, 4,549,898, Cl. 71-90.000.

Gates, Joseph M.: *See*—
Gowan, Norman H.; Petravicius, Stasys; Hernandez, Ignacio T.; Kuhlmann, Robert E.; Vande Walle, Donald R., Jr.; Weddell, Ronald P.; Gates, Joseph M.; Sitzwohl, Kenneth J.; Sands, Charles D.; Gwinn, Rick A.; and Peterman, Milton J., 4,549,664, Cl. 211-131.000.

Gavaletz, Eugene J.: *See*—
Usher, Peter P.; and Gavaletz, Eugene J., 4,549,741, Cl. 277-236.000.

Gazzarrini, Vinicio, to Solis, S.r.l. Method and apparatus for applying a gusset to manufactured goods. 4,549,493, Cl. 112-121.150.

Gebruder Trox Gesellschaft mit beschrankter Haftung: *See*—
Fey, Michael; Finkelstein, Wolfgang; Haaz, Josef; and Riegel, Hans, 4,549,474, Cl. 98-120.000.

Gehrken, Henning-Peter: *See*—
Ernst, Hansgeorg; Gehrken, Henning-Peter; and Paust, Joachim, 4,550,182, Cl. 549-408.000.

Gehrmann, Klaus: *See*—
Auer, Eberhard; Gehrmann, Klaus; Ohorodnik, Alexander; and Rosenthal, Johannes, 4,549,995, Cl. 260-973.000.
Erpenbach, Heinz; Gehrmann, Klaus; Horstermann, Peter; Kubbeler, Hans-Klaus; and Kohl, Georg, 4,549,937, Cl. 203-40.000.

General Dynamics Pomona Division: *See*—
Daukas, Anthony, 4,549,707, Cl. 244-3.210.

General Elecrtric Company: *See*—
Nutter, Norman E., 4,549,740, Cl. 277-189.000.

General Electric Company: *See*—
Anthony, Thomas R., 4,549,912, Cl. 148-33.100.
Bowles, Patrick J.; and Garrett, Lloyd W., 4,549,644, Cl. 198-341.000.
Collins, Patrick C.; and Gasaway, John M., 4,550,058, Cl. 428-412.000.
Dougherty, John J., 4,550,360, Cl. 361-93.000.
Elliott, Henry H., 4,549,985, Cl. 252-631.000.
Faltynek, Robert A., 4,550,152, Cl. 528-15.000.
Gallagher, Patrick E., 4,550,156, Cl. 528-185.000.
Glover, Gary H.; and Pelc, Norbert J., 4,550,371, Cl. 364-414.000.
Jencks, Charles L.; and Castonguay, Roger N., 4,550,300, Cl. 335-16.000.
Jones, James F.; and Starr, John B., Jr., 4,550,155, Cl. 528-176.000.
Laghi, Aldo A., 4,550,006, Cl. 264-328.200.
Schoenig, Frederick C., Jr.; Landry, J. David; Walker, Edward S.; and Lai, Ching C., 4,549,662, Cl. 209-539.000.
Watson, Bruce R., 4,549,679, Cl. 225-2.000.
White, Robert W., 4,549,346, Cl. 29-736.000.

General Electric Company, p.l.c., The: *See*—
Dixon, Angus B., 4,550,269, Cl. 313-331.000.

General Instrument Corp.: *See*—
Rozario, Novellone; and Silverman, Lawrence H., 4,550,265, Cl. 307-494.000.

General Motors Corporation: *See*—
Johnston, Albert D., 4,549,638, Cl. 192-45.000.
Kochy, Fritz B.; and Bayer, Hermann, 4,549,471, Cl. 98-2.090.
Kurtti, Gary R., 4,549,770, Cl. 297-479.000.
Lee, David N.; and Tanner, William M., 4,549,761, Cl. 296-206.000.
Pilarski, Regis V., 4,549,769, Cl. 297-483.000.
Rush, William B., II; and Rask, Rodney B., 4,549,506, Cl. 123-52.0MB.
Sacca, Demetrio B.; and Hoffman, Donald E., 4,549,605, Cl. 165-150.000.
Steele, Robert E., 4,550,303, Cl. 340-80.000.
Wright, Dolph D., 4,549,572, Cl. 137-495.000.

Gens, Theodore A., to BOC Group, Inc., The. Methods for the removal of gaseous impurities from mixed gas streams. 4,550,098, Cl. 502-324.000.

Gentex Corporation: *See*—
Dalton, Jeffrey L.; and Johnson, Philip M., 4,550,059, Cl. 428-409.000.

Georgia Tech Research Institute: *See*—
Myerson, Allan S., 4,550,198, Cl. 560-486.000.

Gerber Products Company: *See*—
Harter, Elton H.; and Villar, Federico F., 4,549,479, Cl. 99-625.000.

Gerding, Beverly J.; and Haller, Richard W. Adjustable needlework stand. 4,549,366, Cl. 38-102.200.

Gerhold, Norman R., to Rohm and Haas Company. Herbicidal compositions of acifluorfen or salts thereof and citrates. 4,549,903, Cl. 71-116.000.

Gerich, Horst. Liquid mixing and purging apparatus. 4,549,676, Cl. 222-145.000.

Gerlach, Klaus; Lange, Wolfgang; and Loh, Dieter, to Akzo NV. Process and an apparatus for enriching liquids with oxygen. 4,549,969, Cl. 210-759.000.

Gerlach, Lawrence L.: *See*—
Hindman, David B.; Gerlach, Lawrence L.; and Wallace, Bruce A., 4,549,893, Cl. 65-28.000.

Gerth, Christian: *See*—
Droescher, Michael; Burzin, Klaus; Gerth, Christian; and Heuer, Horst, 4,550,148, Cl. 525-440.000.

Gervais, Edouard; and Levert, Henri, to Noranda Inc. Process for minimizing foam formation during free falling of molten metal into moulds, launders or other containers. 4,549,598, Cl. 164-66.100.

Gerwick, B. Clifford, III: *See*—
Rogers, Richard B.; and Gerwick, B. Clifford, III, 4,550,192, Cl. 560-62.000.

Getoor, Richard C.: *See*—
Alexander, Robert L.; Getoor, Richard C.; and Reinersman, Dennis J., 4,549,473, Cl. 98-67.000.

Gewerkschaft Eisenhutte Westfalia: *See*—
Plester, Karl-Heinz; Reddig, Klaus-Dieter; and Hessel, Heinz, 4,549,469, Cl. 92-5.00R.

Giachetti, Antonio: *See*—
Engel, Wolfhard; Trummlitz, Gunter; Eberlein, Wolfgang; Mihm, Gerhard; Schmidt, Gunther; Hammer, Rudolf; and Giachetti, Antonio, 4,550,107, Cl. 514-220.000.

Giardino, Pietro: *See*—
Dallatomasina, Franco; Ortica, Roberto; Giardino, Pietro; and Oppici, Ernesto, 4,549,987, Cl. 260-112.50R.

Gibson, George W., to Focus Environmental Systems. Method and apparatus for solar destruction of toxic and hazardous materials. 4,549,528, Cl. 126-438.000.

Giffhorn, Friedrich: *See*—
Roder, Albert; Seidel, Hans; and Giffhorn, Friedrich, 4,550,079, Cl. 435-189.000.

Gillberg, Lars I.: *See*—
Mathiesen, Mait M.; Gillberg, Lars I.; Hellsten, Karl M. E.; and Karlsson, Gunvor B. T., 4,549,881, Cl. 44-51.000.

Gillig, Steven F.; Fergus, George H.; and Barnes, Michael F., to Motorola, Inc. Method and means of detecting the presence of a signal representing voice and of compressing the level of the signal. 4,550,426, Cl. 381-46.000.

Giltnane, Robert, to Plastics Industries, Inc. Non-cylindrical leg system particularly useful for upholstered furniture. 4,549,711, Cl. 248-188.000.

Gilwee, William J., Jr., to United States of America, National Aeronautics and Space Administration. Toughening reinforced epoxy composites with brominated polymeric additives. 4,550,129, Cl. 523-433.000.

Ginley, David S.: *See*—
Baughman, Richard J.; and Ginley, David S., 4,550,014, Cl. 423-289.000.

Giordano Claudio: *See*—
Castaldi, Graziano; and Giordano, Claudio, 4,550,191, Cl. 560-056.000.

Girard, Leon E.: *See*—
Anderson, Lloyd L.; and Girard, Leon E., 4,549,501, Cl. 119-99.000.

Girerd, Jean-Paul: *See*—
Berthelot, Daniel; and Girerd, Jean-Paul, 4,549,924, Cl. 156-470.000.

Gispen, Willem H., to Akzo N.V. Peptides with nerve-regenerating properties. 4,550,099, Cl. 514-14.000.

Gjulling, Eduard V.; Djugovskaya, Larisa A.; Zabolotny, Dmitry I.; Kovtun, Jury P.; Liptuga, Nikolai I.; Litus, Viktor I.; Sambur, Marina B.; Romanov, Nikolai N.; Tolmachev, Alexei I.; Kirsanov, Alexandr V.; Pisanko, Viktor N.; Melnikov, Oleg F.; and Klochkov, Evgeny I., to Institut Organicheskoi Khimii Akademii Nauk Ukrainskoi SSR; and Kievsky Nauchno-Issledovatelsky Institut Otolaringologii. 6-Phenyl-2,3,5,6-tetrahydroimidazo-[2,1-b]-thiazole derivatives. 4,550,170, Cl. 548-154.000.

Glachet, Charles; Francois, Daniel; Tentelier, Jean; and Frioux, Christian, to Commissariat a l'Energie Atomique; and La Calhene Societe Anonyme. Master-slave telescopic remote manipulator. 4,549,839, Cl. 414-7.000.

Glaser, David; and Whelchel, Charles J., to Lucitron, Inc. Method and apparatus for making electric connections into a compliant sealed package. 4,550,039, Cl. 428-13.000.

Globe Manufacturing Co.: *See*—
English, Raymond; and Towle, Michael, 4,549,315, Cl. 2-2.000.

Glover, Gary H.; and Pelc, Norbert J., to General Electric Company. Method and apparatus for compensating CT images for truncated projections. 4,550,371, Cl. 364-414.000.

Glyco-Antriebstechnik GmbH: *See*—
Stich, Bodo; Hassler, Ernst; and Cyphelly, Ivan-Jaroslav, 4,549,862, Cl. 418-133.000.

Gneiss, Heinz; Sumal, Jaihind S.; and Wunsch, Werner, to Robert Bosch GmbH. Device for measuring the mass of a flowing medium. 4,549,433, Cl. 73-204.000.

Goddard, Robert M.: *See*—
Callahan, Michael; and Goddard, Robert M., 4,550,276, Cl. 315-312.000.

Goetz, William J.; and Engel, Thomas G., to Appleton Papers, Inc. Apparatus and process for a decurling system. 4,549,932, Cl. 162-207.000.

Goguen, Louis J., to King Instrument Corporation. Splicer plunger assembly. 4,549,925, Cl. 156-506.000.

Goldman, Irving M.; Kuhla, Donald E.; and Sklavounos, Constantine, to Pfizer Inc. Process for preparing 2-methyl-2-hydroxypropyl piperazine-1-carboxylate compounds. 4,550,164, Cl. 544-291.000.

Goller, Ernst: *See*—
Stoll, Thomas; Ploppa, Jurgen; and Goller, Ernst, 4,549,412, Cl. 66-149.00R.

Gonda, Michihiro; Kitsukawa, Katsumasa; Suzuka, Susumu; Kanasugi, Mikiko; Sato, Yutaka; and Otomo, Kikuo, to Hodogaya Chemical Co., Ltd. Heat sensitive record material. 4,550,329, Cl. 346-214.000.

Gorris, Joannes J. H. M.; and Lenders, Wilhelmus L. L., to U.S. Philips Corporation. Method of manufacturing multiconductor cables. 4,549,335, Cl. 29-866.000.

Goth, George R.; Hansen, Thomas A.; and Makris, James S., to International Business Machines Corporation. Method of selectively exposing the sidewalls of a trench and its use to the forming of a metal silicide substrate contact for dielectric filled deep trench isolated devices. 4,549,927, Cl. 156-643.000.

Goto, Jiro: *See*—
Teraji, Tsutomu; Sakane, Kazuo; and Goto, Jiro, 4,550,102, Cl. 514-206.000.

Gotz, Udo: *See*—
Hoffmann, Dietrich; and Gotz, Udo, 4,549,488, Cl. 102-503.000.

Gowan, Norman H.; Petravicius, Stasys; Hernandez, Ignacio T.; Kuhlmann, Robert E.; Vande Walle, Donald R., Jr.; Weddell, Ronald P.; Gates, Joseph M.; Sitzwohl, Kenneth J.; Sands, Charles D.; Gwinn, Rick A.; and Peterman, Milton J., to Hughes Aircraft Company. Kitting parts carousel system. 4,549,664, Cl. 211-131.000.

Grabovac, Bosko; and Vuceta, Ivan, to Consolidated Devices, Inc. Torque multiplying torque wrench. 4,549,438, Cl. 73-862.210.

Graeme, Jerald G.: *See*—
Millaway, Steven D.; and Graeme, Jerald G., 4,550,291, Cl. 330-277.000.

Graf, Harlan G.; Janssen, Harry R.; and Kurdy, George A., to Conoco, Inc. Flash zone draw tray for coker fractionator. 4,549,934, Cl. 196-98.000.

Granett, Dan: *See*—
Barmatz, Martin B.; Granett, Dan; and Lee, Mark C., 4,549,435, Cl. 73-505.000.

Granville, Clive W., to Flynn Burner Corporation. Method and apparatus for applying heat to articles and materials. 4,549,866, Cl. 432-10.000.

Graziani, Gabriele: *See*—
Nardi, Dante; Tajana, Alberto; Pennini, Renzo; Cazzulani, Pietro; Graziani, Gabriele; and Casadio, Silvano, 4,550,115, Cl. 514-320.000.

Graziani, Kenneth R.; and Sapre, Ajit V., to Mobil Oil Corporation. Conversion of methanol to olefins using large size catalyst particles. 4,550,217, Cl. 585-324.000.

Green, Joseph W.: *See*—
Tobin, Patrick L.; Green, Joseph W.; and Lerohl, John A., 4,549,739, Cl. 273-248.000.

Green, Lawrence S.: *See*—
Meshman, Boris; Kerekes, Thomas A.; Green, Lawrence S.; and Karlinsky, David, 4,550,374, Cl. 364-490.000.

Greenberg, Ronald I.: *See*—
Prengaman, Richard J.; Thurber, Robert E.; Phipps, Joe; Greenberg, Ronald I.; Hom, Wai L.; Jaworski, James F.; and Riffle, Guy W., 4,550,318, Cl. 343-5.0PD.

Gregory, Samuel T. Smoking appliance. 4,549,558, Cl. 131-202.000.

Greigger, Barbara A.: *See*—
Dowbenko, Rostyslaw; and Greigger, Barbara A., 4,550,137, Cl. 525-31.000.

Greitzer, Morris. Swivel chip and card dispenser for game boards. 4,549,738, Cl. 273-148.00A.

Gressett, Charles A., Jr.; and Smith, Daniel J., to Fender Musical Instruments Corporation. Electric bass guitar incorporating fine-tuning and string length-adjusting means. 4,549,460, Cl. 84-298.000.

Grewal, Narinder S.: *See*—
Ambike, Suhas H.; Grewal, Narinder S.; and Blaser, Eric, 4,550,018, Cl. 424-52.000.

Griebel, Heinrich: *See*—
Kille, Ewald; and Griebel, Heinrich, 4,550,266, Cl. 310-19.000.

Grieshaber, Hermann; and Siebert, Hans-Joachim, to Robert Bosch GmbH. Fuel injection system for direct fuel injection in internal combustion engines. 4,549,511, Cl. 123-263.000.

Griffin, Robert M.: *See*—
Kimball, Stephen F.; Audesse, Emery G.; and Griffin, Robert M., 4,550,270, Cl. 313-579.000.

Grigorieva, Natalya D.: *See*—
Lavretskaya, Elionora F.; Rudzit, Ernest A.; Piruzian, Lev A.; Volkova, Ljubov I.; Zakharova, Nina I.; Sarkisian, David A.; Upadysheva, Alexandra V.; Grigorieva, Natalya D.; Znamenskaya, Anna P.; Libinzon, Rakhil E.; and Antonian, Semen G., 4,550,113, Cl. 514-290.000.

Grimm, Paul J.: *See*—
Convis, Danny B.; Grimm, Paul J.; and Reed, Martin A., 4,550,438, Cl. 382-56.000.

Groch, Mark W.; and Domnanovich, James R., to Siemens Gammasonics, Inc. Heart sound detector and cardiac cycle data are combined for diagnostic reliability. 4,549,552, Cl. 128-700.000.

Groeneveld, Wilbur E.; Kluver, Leroy; and Vincent, Michael T., to New Idea Corporation. Apparatus to slice a large round bale. 4,549,481, Cl. 100-98.00R.

Gromek, Francis S.; and Haines, William F., Sr., to New Regina Corporation. Two-part handle assembly for electrical appliance. 4,549,779, Cl. 339-58.000.

Groos, Heinz: *See*—
Trost, Nikolaus B.; and Groos, Heinz, 4,549,419, Cl. 72-4.000.

Groshong, LeRoy E.; and Brawn, Ronald J., to Catheter Technology Corporation. Valved two-way catheter. 4,549,879, Cl. 604-247.000.

Grosscurt, Arnoldus C.: *See*—
Brouwer, Marius S.; and Grosscurt, Arnoldus C., 4,550,202, Cl. 564-23.000.

Grossman, Steven J.: *See*—
Dai, Shenghong A.; Grossman, Steven J.; and Onder, Kemal, 4,550,157, Cl. 528-322.000.

Grove, Leslie W., Jr. Universal support for meters. 4,549,751, Cl. 285-30.000.

Grubb, Daniel B.; and Hughes, Donald W. K., to AMP Incorporated. Applicator for installing two part connector assemblies in cables. 4,549,343, Cl. 29-33.00M.

Gruber, Peter A., to International Business Machines Corporation. Evaporative cooling. 4,549,407, Cl. 62-304.000.

Grumman Aerospace Corporation: *See*—
Paez, Carlos A., 4,549,685, Cl. 228-118.000.

Grundfos A/S: *See*—
Jensen, Niels D.; and Nielsen, Kurt F., 4,549,849, Cl. 415-219.00R.

GTE Automatic Electric Inc.: *See*—
Reimer, William A., 4,550,362, Cl. 361-415.000.

GTE Communication Systems Corporation: *See*—
Neese, Wayne E., 4,549,484, Cl. 101-123.000.
Teater, Albert G., 4,550,226, Cl. 179-81.00R.

GTE Products Corporation: *See*—
Kimball, Stephen F.; Audesse, Emery G.; and Griffin, Robert M., 4,550,270, Cl. 313-579.000.

Gueret, Jean-Louis H.; and Beck, Jean-Paul C., to L'Oreal. Combining device with antistatic properties. 4,549,559, Cl. 132-11.00R.

Gueyne, Jean: *See*—
Seguin, Marie-Christine; and Gueyne, Jean, 4,549,990, Cl. 260-397.250.

Guinn, Douglas B., to Outboard Marine Corporation. Marine propulsion device including cathodic protection. 4,549,949, Cl. 204-197.000.

Guinon, Walter J.; and Lamb, Richard H., Jr., to Charles Stark Draper Laboratory, Inc. Spread spectrum adaptive code tracker. 4,550,414, Cl. 375-1.000.

Gulibon, Robert S.: *See*—
Liang, Dah-Ben; and Gulibon, Robert S., 4,549,615, Cl. 175-389.000.

Gupta, Tapan K.; Carlson, William G.; Osterhout, Joseph C.; Boyette, Gerald B.; and Sweetana, Andrew S., Jr., to Electric Power Research Institute, Inc. Voltage limiting composition and method of fabricating the same. 4,549,981, Cl. 252-518.000.

Guruswamy, Vinodhini: *See*—
Knudson, Mark B.; Sembrowich, Walter L.; and Guruswamy, Vinodhini, 4,549,951, Cl. 204-416.000.

Gutowsky, Arthur C.: *See*—
Simon, Virgil S.; Gutowsky, Arthur C.; and Haluzak, Nestor T., 4,549,712, Cl. 248-224.400.

Gwinn, Rick A.: *See*—
Gowan, Norman H.; Petravicius, Stasys; Hernandez, Ignacio T.; Kuhlmann, Robert E.; Vande Walle, Donald R., Jr.; Weddell, Ronald P.; Gates, Joseph M.; Sitzwohl, Kenneth J.; Sands, Charles D.; Gwinn, Rick A.; and Peterman, Milton J., 4,549,664, Cl. 211-131.000.

Haab, Karl, to Haab, Otto. Sealing means for wall members and wall member for partition walls. 4,549,380, Cl. 52-240.000.

Haab, Otto: *See*—
Haab, Karl, 4,549,380, Cl. 52-240.000.

Haaz, Josef: *See*—
Fey, Michael; Finkelstein, Wolfgang; Haaz, Josef; and Riegel, Hans, 4,549,474, Cl. 98-120.000.

Hachmeister, Bernd: *See*—
Schoen, Uwe; Hachmeister, Bernd; Kehrbach, Wolfgang; Kuehl, Ulrich; and Buschmann, Gerd, 4,550,112, Cl. 514-278.000.

Haedo, Edmundo, to K. L. Spring & Stamping Corporation. Flexible chair back. 4,549,764, Cl. 297-296.000.

Hagemann, Hermann; Klauke, Erich; and Kysela, Ernst, to Bayer Aktiengesellschaft. Preparation of new fluoropivalic acid fluorides. 4,549,994, Cl. 260-544.00F.

Hager, Clarence H. Vehicle coupling apparatus with sway dampening. 4,549,746, Cl. 280-446.00B.

Haggar Company: *See*—
Off, Joseph W. A.; and Early, Judson H., 4,549,916, Cl. 156-93.000.

Haghiri-Tehrani, Yahya: *See*—
Hoppe, Joachim; and Haghiri-Tehrani, Yahya, 4,550,248, Cl. 235-492.000.

Haines, William F., Sr.: *See*—
Gromek, Francis S.; and Haines, William F., Sr., 4,549,779, Cl. 339-58.000.

Hakki, A-Hadi I. Pacemaker electrode. 4,549,557, Cl. 128-785.000.

Hakoda, Kouzou, to Ryobi Ltd. Dust collecting apparatus for sander. 4,549,371, Cl. 51-170.0MT.

Halabiya, Sabah, to Deere & Company. Pressure modulator valve. 4,549,564, Cl. 137-110.000.

Haley, Thomas S., Sr. Transportable and collapsable bag carrying cart. 4,549,748, Cl. 280-641.000.

Hall, Iris H.: *See*—
McPhail, Andrew T.; Spielvogel, Bernard F.; and Hall, Iris H., 4,550,186, Cl. 556-8.000.

Hall, John B.; Sprecker, Mark A.; Belko, Robert P.; Van Loveren, Augustinus G.; and Hanna, Marie R., to International Flavors & Fragrances Inc. 1-Oxoalkyl-2-isopropylnorbornane derivatives, uses thereof in augmenting or enhancing the aroma of consumable materials and processes for preparing same. 4,549,982, Cl. 252-522.00R.

Hall, Mitchell A., to Monarch Tool & Manufacturing Co. Lock box and method of making same. 4,549,418, Cl. 70-85.000.

Hall, Steven E.: *See*—
Das, Jagabandhu; and Hall, Steven E., 4,550,120, Cl. 514-469.000.

Haller, Richard W.: *See*—
Gerding, Beverly J.; and Haller, Richard W., 4,549,366, Cl. 38-102.200.

Halliburton Company: *See*—
Freeman, Tommie A., 4,549,580, Cl. 138-89.000.

Hallock, Louis L.: *See*—
Purcell, Robert F.; and Hallock, Louis L., 4,549,883, Cl. 44-57.000.

Haluzak, Nestor T.: *See*—
Simon, Virgil S.; Gutowsky, Arthur C.; and Haluzak, Nestor T., 4,549,712, Cl. 248-224.400.

Hamada, Masa: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Naganawa, Hiroshi; Sawa, Tsutomu; Uchida, Takeshi; and Imoto, Masaya, 4,550,159, Cl. 536-6.400.

Hamalainen, Kaarlo J., to RCA Corporation. Adaptive automatic scan tracking system. 4,550,351, Cl. 360-77.000.

Hamamura, Masuzo. Method of manufacturing durable metal molds by metal melt-spraying. 4,549,597, Cl. 164-35.000.

Hammarstedt, Ulf: *See*—
Ek, Kenneth; and Hammarstedt, Ulf, 4,549,970, Cl. 210-776.000.

Hammer, Rudolf: *See*—
Engel, Wolfhard; Trummlitz, Gunter; Eberlein, Wolfgang; Mihm, Gerhard; Schmidt, Gunther; Hammer, Rudolf; and Giachetti, Antonio, 4,550,107, Cl. 514-220.000.

Hampshire, James F.; and Wilkinson, Beverly L., to Rubbermaid Commercial Products Inc. Adjustable foot support. 4,549,767, Cl. 297-439.000.

Hanel, Henry: *See*—
Korppoo, Seppo; and Hanel, Henry, 4,549,626, Cl. 180-127.000.

Hanji, Katsumi; and Kawai, Kiyoshi, to Sumitomo Chemical Company, Limited. Solid catalyst component for olefin polymerization. 4,550,094, Cl. 502-110.000.

Hankins, Timothy R. F.: *See*—
Galloway, John L.; Hankins, Timothy R. F.; and Owers, Ian A., 4,550,311, Cl. 340-531.000.
Galloway, John L.; and Hankins, Timothy R. F., 4,550,312, Cl. 340-539.000.

Hanna, Marie R.: *See*—
Hall, John B.; Sprecker, Mark A.; Belko, Robert P.; Van Loveren, Augustinus G.; and Hanna, Marie R., 4,549,982, Cl. 252-522.00R.

Hanni, Manfred; and Brusch, Josef, to Siemens Aktiengesellschaft. Process for interception-protected frequency band compressed transmission of speech signals. 4,550,222, Cl. 179-1.50R.

Hans, Rudiger; and Brandenstein, Manfred, to SKF Kugellagerfabriken GmbH. Expanding wedge actuation device. 4,549,442, Cl. 74-110.000.

Hansen, Quinten A. Clutch control for a rotation and reciprocation transmission. 4,549,639, Cl. 192-48.910.

Hansen, Thomas A.: *See*—
Goth, George R.; Hansen, Thomas A.; and Makris, James S., 4,549,927, Cl. 156-643.000.

Hara, Naoto: *See*—
Miyakoshi, Shinichi; and Hara, Naoto, 4,549,510, Cl. 123-90.270.

Harada, Takakiyo: *See*—
Chiba, Hiromasa; Kumahara, Katsumi; Harada, Takakiyo; Oka, Takahiro; and Sato, Akihiro, 4,550,144, Cl. 525-247.000.

Harada, Toyohei: *See*—
Hirauchi, Yukio; Nakano, Kazuhiro; and Harada, Toyohei, 4,549,523, Cl. 126-97.000.

Hares, George B.: *See*—
Araujo, Roger J.; Hares, George B.; Kerko, David J.; Morgan, David W.; and Morse, David L., 4,549,894, Cl. 65-30.110.

Hargrave, Fred M., Jr. Plastic lid flipper. 4,549,521, Cl. 124-5.000.

Haried, John C. Programmable air recirculator/mixer for a fabric dryer. 4,549,362, Cl. 34-31.000.

Harris Corporation: *See*—
Abend, Robert J.; and Shelton, C. Byron, Jr., 4,549,338, Cl. 29-569.00L.

Harris, Cynthia J. Composite cytologic counterstain formulation. 4,550,016, Cl. 424-3.000.

Harris, James E.: *See*—
Rimsa, Stephen B.; Harris, James E.; Chao, Herbert S.; and Maresca, Louis M., 4,550,140, Cl. 525-132.000.

Harris-Marinoni S.A.: *See*—
Odeau, Michel, 4,549,728, Cl. 270-46.000.

Harris, Richard J., Jr., to Spy Mirrors, Inc. Mirror and mounting device. 4,549,790, Cl. 350-624.000.

Harrison, Stuart M. Cutting apparatus. 4,549,349, Cl. 30-92.000.

Harrison, William H., to Frequency West Inc. RF Component having self-biasing to eliminate multipacting. 4,550,297, Cl. 333-99.0MP.

Harrow, Donald A. Cup and roll machine. 4,549,422, Cl. 72-131.000.

Harsco Corporation: *See*—
Fay, William A., III, 4,549,671, Cl. 220-344.000.

Harter, Elton H.; and Villar, Federico F., to Gerber Products Company. Papaya scraping machine. 4,549,479, Cl. 99-625.000.

Hartman, Robert J.: *See*—
Reichel, Curtis J.; and Hartman, Robert J., 4,550,194, Cl. 560-200.000.

Hartmann, Waldemar: *See*—
Ritschel, Peter; Freudenreich, Herbert; and Hartmann, Waldemar, 4,549,915, Cl. 156-78.000.

Hartry, Donald R.; and Belli, Remo D., to Remo, Inc. Apparatus and method for mounting a head on a musical instrument and a method of drum construction. 4,549,462, Cl. 84-413.000.

Hartwig, Carl S. M.; Ljung, Erik A.; and Obel, Erik M., to Institut CERAC S.A. Method and device for controlling a brushless alternating current motor. 4,550,282, Cl. 318-808.000.

Hasegawa, Akio; and Kojima, Hiroshige, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for the preparation of a plasminogen activator. 4,550,080, Cl. 435-212.000.

Hasegawa, Katsuji; and Ibuki, Yasuhiro, to Meinan Machinery Works, Inc. Veneer lathe. 4,549,587, Cl. 144-209.00R.

Hashimoto, Tatsutoshi, to Olympus Optical Company Limited. Corona charger of scorotron type. 4,550,253, Cl. 250-326.000.

Hashiyama, Mitsuaki: *See*—
Iwama, Satoshi; and Hashiyama, Mitsuaki, 4,550,135, Cl. 524-495.000.

Hashmi, Mohammed S. J.; and Symmons, George R., to National Research Development Corporation. Method and apparatus for reducing the section of elongated components. 4,549,421, Cl. 72-41.000.

Hassler, Ernst: *See*—
Stich, Bodo; Hassler, Ernst; and Cyphelly, Ivan-Jaroslav, 4,549,862, Cl. 418-133.000.

Hatano, Hideki, to Pioneer Electronic Corporation. Magneto-optic information recording system. 4,550,346, Cl. 358-330.000.

Hattori, Akira; and Tsuchimoto, Takamitsu, to Fujitsu Limited. Data processing system having hierarchical memories. 4,550,367, Cl. 364-200.000.

Hattori, Takashi: *See*—
Ito, Toshimitsu; Isobe, Toshiaki; and Hattori, Takashi, 4,550,373, Cl. 364-431.040.

Hawkins, Albert P.; Boyle, Alan; and Stone, Alan M., to CRA Exploration Pty. Ltd. Particle sorting apparatus utilizing controllable corona discharge needle. 4,549,659, Cl. 209-3.200.

Hawkins, David K.; and Sauvageau, Donald R., to Morton Thiokol, Inc. Inflatable, aerodynamic shroud. 4,549,464, Cl. 89-1.809.

Hayafuji, Yoshinori; Sawada, Akashi; Usui, Setsuo; and Shibata, Akikazu, to Sony Corporation. Wafer construction for making single-crystal semiconductor device. 4,549,913, Cl. 148-33.000.

Hayakawa, Noriyuki: *See*—
Endo, Mitsuhi; Taniguchi, Toshiaki; Sahara, Teruyoshi; Hayakawa, Noriyuki; Yoshitomi, Tatsuo; Takahashi, Kozo; Nagatani, Yoshiteru; Kawai, Hidenao; Kaizyo, Shuichi; Nakagawa, Yoichi; Yamagami, Kazuo; Takizawa, Teruo; and Suzuki, Tomio, 4,549,472, Cl. 98-34.600.

Hayashi, Shigeo: *See*—
Ando, Takehiro; Miyake, Shuji; Murakami, Osamu; Kawabata, Takashi; Hayashi, Shigeo; Otonari, Michiyasu; and Kato, Toyoaki, 4,549,835, Cl. 405-4.000.

Hayashida, Akira: *See*—
Takamizawa, Minoru; Kobayashi, Taishi; Hayashida, Akira; and Takeda, Yoshihumi, 4,550,151, Cl. 528-7.000.

Hayman, Julius, to RCA Corporation. Multilevel thresholding for target tracking apparatus. 4,550,435, Cl. 382-9.000.

Hazeltine Corporation: *See*—
Rosanes, A., 4,550,416, Cl. 375-59.000.

Hebert, Camile J. Penstock. 4,549,837, Cl. 405-101.000.

Hebert, Francis A., to Soloco, Inc. Portable pneumatic nail driving apparatus. 4,549,682, Cl. 227-119.000.

Hedberg, Frederick L.; and Unroe, Marilyn R., to University of Dayton, The. Process for preparing halogen-terminated oligomers useful in the production of acetylene-terminated resins. 4,550,210, Cl. 568-33.000.

Hedin, Raymond C.: *See*—
Andersen, David P.; Hedin, Raymond C.; and Siebenand, John F., 4,550,425, Cl. 381-30.000.

HEI, Inc.: *See*—
Mueller, Wayne A.; and Schuette, Scott D., 4,550,250, Cl. 250-203.00R.

Heinz, Rudolf: *See*—
Dobler, Klaus; Heinz, Rudolf; Schoor, Ulrich; and Frey, Thomas, 4,549,430, Cl. 73-115.000.

Helber, Carlyle L., Jr.: *See*—
Ludwig, Frank A.; and Helber, Carlyle L., Jr., 4,550,036, Cl. 427-443.100.

Hellsten, Karl M. E.: *See*—
Mathiesen, Mait M.; Gillberg, Lars I.; Hellsten, Karl M. E.; and Karlsson, Gunvor B. T., 4,549,881, Cl. 44-51.000.

Hemphill, Dean P.; and Phifer, Edward H., to Shell Oil Company. Ice slot construction. 4,549,836, Cl. 405-61.000.

Henderson, James A.: *See*—
Travlos, Constantine M.; Henderson, James A.; and Weixel, Mark, 4,549,347, Cl. 29-749.000.

Henderson, James A., Jr.; and Tennant, Chris B., to Motorola, Inc. Remote digital volume control system. 4,550,400, Cl. 370-85.000.

Hendrix, James E.; Daniels, John Y.; and White, Taryn M., to Springs Industries, Inc. Silicone durable press textile treatment process with radiation curing and resulting product. 4,549,880, Cl. 8-115.520.

Henkel Corporation: *See*—
Willging, Stephen M., 4,550,183, Cl. 549-413.000.

Hesse, Thomas R.; and Rudolph, Ronald M., to Applied Power, Inc. Datum point location method and apparatus. 4,549,359, Cl. 33-516.000.

Hensley, Albert L., Jr.; and Quick, Leonard M., to Amoco Corporation. Hydrotreating catalyst and process. 4,549,957, Cl. 208-216.0PP.

Hermann Berstorff Maschinenbau GmbH: *See*—
Uhland, Eberhard; Dienst, Manfred; and Wente, Claus-Heinrich, 4,550,002, Cl. 264-40.100.

Hermann, Karl H.: *See*—
Nielinger, Werner; Hermann, Karl H.; and Michael, Dietrich, 4,550,133, Cl. 524-399.000.

Hernandez, Ignacio T.: *See*—
Gowan, Norman H.; Petravicius, Stasys; Hernandez, Ignacio T.; Kuhlmann, Robert E.; Vande Walle, Donald R., Jr.; Weddell, Ronald P.; Gates, Joseph M.; Sitzwohl, Kenneth J.; Sands, Charles D.; Gwinn, Rick A.; and Peterman, Milton J., 4,549,664, Cl. 211-131.000.

Herr, Herbert W.; Moon, Seaton; and Hopper, James E., to Deere & Company. Quick coupler latch. 4,549,744, Cl. 280-415.00A.

Herrin, Melvin B.; and Chandler, Henry M., to Herrin, Melvin B. Apparatus and method for aligning and joining individual blanks. 4,549,878, Cl. 493-334.000.

Herrin, Thomas R.: *See*—
Voss, Houston F.; Plattner, Jacob; and Herrin, Thomas R., 4,550,163, Cl. 544-244.000.

Hessel, Heinz: *See*—
Plester, Karl-Heinz; Reddig, Klaus-Dieter; and Hessel, Heinz, 4,549,469, Cl. 92-5.00R.

Hesston Corporation: *See*—
Esau, Edward W., 4,549,482, Cl. 100-191.000.

Hestex Systems b.v.: *See*—
Sterl, Rudolf, 4,549,832, Cl. 403-264.000.

Hettinger, William P., Jr.: *See*—
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Hettinger, William P., Jr.; Kovach, Stephen M.; Palmer, James L.; and Zandona, Oliver J., 4,549,958, Cl. 208-253.000.

Heuer, Horst: *See*—
Droescher, Michael; Burzin, Klaus; Gerth, Christian; and Heuer, Horst, 4,550,148, Cl. 525-440.000.

Hewlett-Packard Company: *See*—
Allen, Ross R.; and Allen, Daniel E., 4,550,326, Cl. 346-140.00R.
Hiller, Donald R.; and Kingsford-Smith, Charles, 4,550,309, Cl. 340-347.0AD.

Hezzell, David J.: *See*—
Cogswell, Frederic N.; and Hezzell, David J., 4,549,920, Cl. 156-181.000.

HGM, Inc.: *See*—
Tanner, Howard M. C., 4,549,787, Cl. 350-315.000.

Hibbs, David A.; Rickey, Wynn P.; and Stanton, Paul N., to Exxon Production Research Co. Coded fluid control system. 4,549,578, Cl. 137-624.110.

Hibler, Donald R., Jr.; and Mask, Ernest D. Ratchet lock mechanism for exercise hip, leg and squat sled. 4,549,734, Cl. 272-134.000.

Hibyan, Edward S., to United Technologies Corporation. Helicopter blade droop stop with slidable droop stop seat. 4,549,852, Cl. 416-140.000.

Hickman, John B., to W. P. Hickman Company. Roof edge construction. 4,549,376, Cl. 52-94.000.

Hider, Robert C.; Kontoghiorghes, George; Silver, Jack; and Stockham, Michael A., to National Research Development Corporation. Iron complexes of hydroxy pyridones useful for treating iron deficiency anemia. 4,550,101, Cl. 514-188.000.

Highland Manufacturing & Sales Co.: *See*—
Weder, Erwin H.; Weder, Donald E.; and Weder, Herbert A., 4,549,908, Cl. 106-266.000.

Hijikata, Isamu: *See*—
Uehara, Akira; Hijikata, Isamu; Nakane, Hisashi; and Nakayama, Muneo, 4,550,239, Cl. 219-121.0PG.
Uehara, Akira; Hijikata, Isamu; Nakane, Hisashi; and Nakayama, Muneo, 4,550,242, Cl. 219-121.0PG.

Hijiya, Toyoto: *See*—
Takemoto, Tadashi; Hijiya, Toyoto; and Yamatani, Tetsuo, 4,550,180, Cl. 549-253.000.

Hiller, Donald R.; and Kingsford-Smith, Charles, to Hewlett Packard Company. Analog to digital converter. 4,550,309, Cl. 340-347.0AD.

Hilti Aktiengesellschaft: *See*—
Rumpp, Gerhard; and Scholz, Dieter, 4,549,616, Cl. 175-394.000.

Hindman, David B.; Gerlach, Lawrence L.; and Wallace, Bruce A., to French Systems, Inc. Hot cullet handling apparatus. 4,549,893, Cl. 65-28.000.

Hinkle, Philip: *See*—
Thompson, Richard T.; Hinkle, Philip; and Carroll, Robert B., 4,550,041, Cl. 428-35.000.

Hirabayashi, Yuzi: *See*—
Takao, Mitsunori; Kimura, Takahiko; and Hirabayashi, Yuzi, 4,549,512, Cl. 123-339.000.

Hirai, Osamu; Kobayashi, Tetsuo; Kuwatsuka, Shunichiro; and Suzuki, Saburo, to Computer Basic Technology Research. Thin-film magnetic head and method for fabricating the same. 4,550,353, Cl. 360-125.000.

Hiramoto, Kazuyuki: *See*—
Sato, Makoto; and Hiramoto, Kazuyuki, 4,550,375, Cl. 364-474.000.

Hirano, Shigeo: *See*—
Miyasaka, Tsutomu; Kobayashi, Hidetoshi; Itoh, Isamu; and Hirano, Shigeo, 4,550,070, Cl. 430-202.000.

Hirano, Yoshinori, to Nissan Motor Co., Ltd. Cooling system for automotive engine or the like. 4,549,505, Cl. 123-41.080.

Hirata, Akio, to Tokyo Shibaura Denki Kabushiki Kaisha. Synchronous motor control. 4,550,281, Cl. 318-723.000.

Hirauchi, Yukio; Nakano, Kazuhiro; and Harada, Toyohei, to Matsushita Electric Industrial Co., Ltd. Heating apparatus. 4,549,523, Cl. 126-97.000.
Hirosawa, Toshio; Ohki, Masaru; Miyazaki, Katuto; Kobayashi, Nobuo; and Koizumi, Naoko, to Hitachi, Ltd. Terminal controller. 4,550,386, Cl. 364-900.000.
Hirose, Akio. Golf club adjuster. 4,549,357, Cl. 33-508.000.
Hirotani, Toyotoshi: *See*—
Kishi, Yoshiki; Hirotani, Toyotoshi; Ohira, Tomohiro; and Fukui, Yukio, 4,550,294, Cl. 332-7.510.
Hirsch, Gerhard: *See*—
Ehrlinger, Wolfgang; Hirsch, Gerhard; and Alberty, Michael, 4,550,296, Cl. 333-26.000.
Hirte, Klaus: *See*—
Evans, Elfed H.; Hirte, Klaus; and Stremmel, Gerd, 4,549,978, Cl. 252-109.000.
Hitachi Construction Machinery Co., Ltd.: *See*—
Sekino, Syoichi, 4,549,640, Cl. 192-0.094.
Hitachi Koki Company, Ltd.: *See*—
Yamamoto, Kunio; Ichikawa, Kaoru; and Moriguchi, Seki, 4,549,681, Cl. 227-8.000.
Hitachi, Ltd.: *See*—
Abe, Osamu; Mouri, Yasunori; and Sugiura, Noboru, 4,549,514, Cl. 123-425.000.
Endo, Mitsushi; Taniguchi, Toshiaki; Sahara, Teruyoshi; Hayakawa, Noriyuki; Yoshitomi, Tatsuo; Takahashi, Kozo; Nagatani, Yoshiteru; Kawai, Hidenao; Kaizyo, Shuichi; Nakagawa, Yoichi; Yamagami, Kazuo; Takizawa, Teruo; and Suzuki, Tomio, 4,549,472, Cl. 98-34.600.
Hirosawa, Toshio; Ohki, Masaru; Miyazaki, Katuto; Kobayashi, Nobuo; and Koizumi, Naoko, 4,550,386, Cl. 364-900.000.
Horiba, Tatsuo; Fujita, Kazunori; Matsuda, Shinpei; and Tamura, Kohki, 4,550,067, Cl. 429-213.000.
Imada, Yosinobu; and Nakashima, Akio, 4,550,348, Cl. 358-342.000.
Ishige, Ryohei, 4,549,841, Cl. 414-282.000.
Kobayashi, Yoshiki; and Fukushima, Tadashi, 4,550,437, Cl. 382-41.000.
Maeda, Takeshi; Takasago, Masahiro; and Tsunoda, Yoshito, 4,550,394, Cl. 369-46.000.
Nagasawa, Kouichi; Ikeda, Shuji; Suzuki, Norio; and Sakai, Yoshio, 4,549,340, Cl. 29-571.000.
Orikasa, Tetsuo, 4,549,583, Cl. 140-92.100.
Shimada, Shigeru; Kakumoto, Shigeru; and Abe, Osamu, 4,550,434, Cl. 382-9.000.
Sugimoto, Koichi, 4,550,383, Cl. 364-513.000.
Takahashi, Isao, 4,550,356, Cl. 361-9.000.
Terada, Toshimichi; Kuroyanagi, Tomomitsu; Kozima, Noboru; and Shibata, Akira, 4,550,345, Cl. 358-323.000.
Toyooka, Takashi; Yoshida, Kazutoshi; Ishida, Kazuhiro; Okahashi, Tatsuo; Aoki, Hirokazu; Suzuki, Ryo; and Sugita, Yutaka, 4,550,388, Cl. 365-6.000.
Usui, Toshifumi; and Yanagisawa, Syozo, 4,549,399, Cl. 60-286.000.
Wakabayashi, Manabu; Minami, Kihachiro; Sanpei, Tohru; and Konno, Kazutoshi, 4,550,354, Cl. 360-133.000.
Hitachi Microcomputer Engineering Ltd.: *See*—
Toyooka, Takashi; Yoshida, Kazutoshi; Ishida, Kazuhiro; Okahashi, Tatsuo; Aoki, Hirokazu; Suzuki, Ryo; and Sugita, Yutaka, 4,550,388, Cl. 365-6.000.
Hitachi Plant Engineering & Construction Co.: *See*—
Endo, Mitsushi; Taniguchi, Toshiaki; Sahara, Teruyoshi; Hayakawa, Noriyuki; Yoshitomi, Tatsuo; Takahashi, Kozo; Nagatani, Yoshiteru; Kawai, Hidenao; Kaizyo, Shuichi; Nakagawa, Yoichi; Yamagami, Kazuo; Takizawa, Teruo; and Suzuki, Tomio, 4,549,472, Cl. 98-34.600.
Hitachi Zosen Corporation: *See*—
Ando, Takehiro; Miyake, Shuji; Murakami, Osamu; Kawabata, Takashi; Hayashi, Shigeo; Otonari, Michiyasu; and Kato, Toyoaki, 4,549,835, Cl. 405-4.000.
Hittenberger, William H.: *See*—
Baker, Thomas R.; Hittenberger, William H.; and Posen, Boris J., 4,549,876, Cl. 493-169.000.
Hlavka, Joseph J.; Bitha, Panayota; and Lin, Yang-I, to American Cyanamid Company. Platinum chelates of 2-hydrazino-azoles. 4,550,169, Cl. 548-108.000.
HNU Systems, Inc.: *See*—
Driscoll, John N.; and Atwood, Edwards S., 4,549,953, Cl. 204-419.000.
Hoashi, Kenzo; and Uehara, Kazuo, to kabushiki Kaisha Komatsu Seisakusho. Split type oil hydraulic piston pump and pressurized oil feed circuit making use of the same pump. 4,549,466, Cl. 91-6.500.
Hoch, John J., to Deere & Company. Bracket assembly for adjustably mounting a seat. 4,549,765, Cl. 297-311.000.
Hochberg, Howard M., to Spacelabs, Inc. Apparatus and method for use in a medical gas sampling system. 4,549,553, Cl. 128-719.000.
Hodgson, Rodney T.: *See*—
Binnig, Gerd K.; Feenstra, Randall M.; Hodgson, Rodney T.; Rohrer, Heinrich; and Woodall, Jerry M., 4,550,257, Cl. 250-492.200.
Hodogaya Chemical Co., Ltd.: *See*—
Gonda, Michihiro; Kitsukawa, Katsumasa; Suzuka, Susumu; Kanasugi, Mikiko; Sato, Yutaka; and Otomo, Kikuo, 4,550,329, Cl. 346-214.000.
Hoechst Aktiengesellschaft: *See*—
Andrae, Klaus; and Hutschenreuter, Elfriede, 4,550,042, Cl. 428-36.000.
Auer, Eberhard; Gehrmann, Klaus; Ohorodnik, Alexander; and Rosenthal, Johannes, 4,549,995, Cl. 260-973.000.
Erpenbach, Heinz; Gehrmann, Klaus; Horstermann, Peter; Kubbeler, Hans-Klaus; and Kohl, Georg, 4,549,937, Cl. 203-40.000.
Felcht, Utz-Hellmuth; and Buchberger, Gerhard, 4,550,161, Cl. 536-90.000.
Koch, Manfred; and Maier, Thomas, 4,550,174, Cl. 548-306.000.
Pliefke, Engelbert, 4,549,944, Cl. 204-129.100.
Hoffman, Donald E.: *See*—
Sacca, Demetrio B.; and Hoffman, Donald E., 4,549,605, Cl. 165-150.000.
Hoffman, Keith A.: *See*—
Bessinger, Walter L.; and Hoffman, Keith A., 4,549,774, Cl. 308-3.800.
Hoffman, Michael A. Walking course. 4,549,732, Cl. 272-70.000.
Hoffman, Nelson N.: *See*—
Chenausky, Peter P.; Hoffman, Nelson N.; and Laughman, Lanny M., 4,550,410, Cl. 372-97.000.
Hoffmann, Dietrich; and Gotz, Udo, to Mauser-Werke Oberndorf GmbH. Projectile having a tubular body. 4,549,488, Cl. 102-503.000.
Hoffmann-La Roche Inc.: *See*—
Fryer, Rodney I.; Trybulski, Eugene J.; and Walser, Armin, 4,549,988, Cl. 260-239.0BB.
LeMahieu, Ronald A., 4,550,190, Cl. 560-053.000.
Hoffmann, Werner: *See*—
Janitschke, Lothar; and Hoffmann, Werner, 4,550,211, Cl. 568-361.000.
Hoffmaster, Timothy D., to AT&T Bell Laboratories. Process for measuring fluorescence. 4,549,807, Cl. 356-318.000.
Hoffstetter, Armand C. L.; and Cason, Charles K., to Ga-Vehren Engineering Company. Overlap conveyor apparatus. 4,549,729, Cl. 270-53.000.
Hofmeister, Helmut; Schulze, Paul E.; Annen, Klaus; Laurent, Henry; and Wiechert, Rudolf, to Schering Aktiengesellschaft. Process for the preparation of 17α-bromoethynyl- and 17α-iodoethynyl-17β-hydroxy steroids and novel products thereof. 4,550,100, Cl. 514-179.000.
Hoh, George L., to Du Pont de Nemours, E. I., and Company. Blends of ionomer with propylene copolymer. 4,550,141, Cl. 525-221.000.
Holcombe, Cressie E.; Masters, David R.; and Pfeiler, William A., to United States of America, Energy. Carbon-free induction furnace. 4,550,412, Cl. 373-155.000.
Holland, Scott B.; and Strachan, Bruce D., to Ford Motor Company. Onboard method of detecting electrical faults in a vehicular air suspension system. 4,550,286, Cl. 324-51.000.
Hollingsead International, Inc.: *See*—
Espinoza, H. Cesar, 4,549,602, Cl. 165-80.200.
Holstein & Kappert GmbH: *See*—
Kruger, Roland; and Ehrlinger, Klaus, 4,550,029, Cl. 426-487.000.
Holtz, Neal. Composite joist system. 4,549,381, Cl. 52-337.000.
Hom, Wai L.: *See*—
Prengaman, Richard J.; Thurber, Robert E.; Phipps, Joe; Greenberg, Ronald I.; Hom, Wai L.; Jaworski, James F.; and Riffle, Guy W., 4,550,318, Cl. 343-5.0PD.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Komuro, Katsusuke, 4,549,629, Cl. 180-219.000.
Koumura, Takashi, 4,549,516, Cl. 123-478.000.
Koumura, Takashi, 4,549,518, Cl. 123-478.000.
Miyakoshi, Shinichi; and Hara, Naoto, 4,549,510, Cl. 123-90.270.
Nakadate, Toshihiko; and Numata, Morikuni, 4,550,236, Cl. 219-86.310.
Honeywell Inc.: *See*—
Abrokwah, Jonathan K., 4,550,031, Cl. 427-10.000.
West, Gerald W., 4,550,359, Cl. 361-56.000.
Honig, Helmut: *See*—
Paar, Willibald; and Honig, Helmut, 4,550,146, Cl. 525-327.300.
Hopkins, Melvyn D.: *See*—
Bolin, Philip C.; Bowman, Gary K.; Ellis, Charles S.; Hopkins, Melvyn D.; and Kane, Richard E., 4,550,219, Cl. 174-21.00C.
Hoppe, Gerald W. System for conditioning grain and maintaining same. 4,549,960, Cl. 209-240.000.
Hoppe, Joachim; and Haghiri-Tehrani, Yahya, to GAO Gesellschaft fur Automation und Organisation GmbH. Identification card having an IC module. 4,550,248, Cl. 235-492.000.
Hopper, James E.: *See*—
Herr, Herbert W.; Moon, Seaton; and Hopper, James E., 4,549,744, Cl. 280-415.00A.
Hora, Josef: *See*—
Husak, Zdenek; Svozil, Zdenek; Mazak, Ivan; Lehky, Josef; Hora, Josef; Smid, Zdenek; and Kebrle, Ondrej, 4,549,742, Cl. 280-11.180.
Horbelt, Michael; Schnurle, Hans; Strauss, Peter; and Werner, Peter, to Robert Bosch GmbH. Method for operating an apparatus for a fuel control system of an internal combustion engine during overrunning. 4,549,519, Cl. 123-493.000.
Horiba, Tatsuo; Fujita, Kazunori; Matsuda, Shinpei; and Tamura, Kohki, to Hitachi, Ltd. Secondary battery. 4,550,067, Cl. 429-213.000.
Horike, Masanori: *See*—
Sato, Tsutomu; and Horike, Masanori, 4,550,321, Cl. 346-75.000.
Horiuchi, Shigenori; and Shinohara, Takeru, to Hoya Corporation. Light beam deflector emitting a pair of output light beams on planes intersecting to each other. 4,549,789, Cl. 350-358.000.
Hormel, Ronald F.; and Miesterfeld, Frederick O. R., to Chrysler Corporation. Fluid level sensor circuitry. 4,550,261, Cl. 307-118.000.

Horn, Richard E., to Electrochem International, Inc. Process and an electrodialytic cell for electrodialytically regenerating a spent electroless copper plating bath. 4,549,946, Cl. 204-182.400.
Horodysky, Andrew G., to Mobil Oil Corporation. Lubricants containing sulfurized organic acid diamine salts. 4,549,974, Cl. 252-33.600.
Horodysky, Andrew G., to Mobil Oil Corporation. Borated adducts of diamines and alkoxides, as multifunctional lubricant additives, and compositions thereof. 4,549,975, Cl. 252-49.600.
Horodysky, Andrew G.; and Landis, Phillip S., to Mobil Oil Corporation. Lubricant composition containing reaction products of vicinal diols and phosphorus oxyhalides. 4,549,976, Cl. 252-49.800.
Horstermann, Peter: *See*—
Erpenbach, Heinz; Gehrmann, Klaus; Horstermann, Peter; Kubbeler, Hans-Klaus; and Kohl, Georg, 4,549,937, Cl. 203-40.000.
Horton, Donelson B. Fluid distributor. 4,549,567, Cl. 137-262.000.
Horton, Joel R., to United States of America, Energy. Power recovery system for coal liquefaction process. 4,549,954, Cl. 208-8.0LE.
Hosch, Ludwig, to Rohm GmbH. Method for polymerizing methyl methacrylate. 4,550,136, Cl. 524-718.000.
Howard, Richard E.: *See*—
Damen, Theodoor C.; Duguay, Michael A.; Howard, Richard E.; Jackel, Lawrence D.; and Skocpol, William J., 4,550,249, Cl. 250-201.000.
Howes, Trevor D.: *See*—
Sexton, John S.; Stone, Brian J.; Howes, Trevor D.; and Andrew, Colin, 4,549,372, Cl. 51-206.00R.
Hoxan Corporation: *See*—
Fujioka, Koji, 4,549,816, Cl. 374-27.000.
Hoy, Walter S.; and Roettele, Donald L. Skylight assembly. 4,549,379, Cl. 52-200.000.
Hoya Corporation: *See*—
Horiuchi, Shigenori; and Shinohara, Takeru, 4,549,789, Cl. 350-358.000.
Izumitani, Tetsuro; Takajoh, Toshi; and Kinjo, Iwao, 4,549,895, Cl. 65-134.000.
Hubel, Werner: *See*—
Disteldorf, Josef; Hubel, Werner; and Reiffer, Johannes, 4,549,991, Cl. 260-453.0PH.
Hubler, Lawrence C.: *See*—
Braun, Oskar J.; Hubler, Lawrence C.; and Sisson, Jeffrey L., 4,549,804, Cl. 355-14.0SH.
Huckler, Volker; Sonns, Eugen; Schafer, Helmut; and Nobis, Dieter, to Deere & Company. Gear shift arrangement for a vehicle. 4,549,637, Cl. 192-3.630.
Huffhines, Donald F.; and Roach, Robert E., to Mobil Oil Corporation. Floatation apparatus for marine seismic exploration. 4,549,499, Cl. 114-244.000.
Hughes Aircraft Company: *See*—
Gowan, Norman H.; Petravicius, Stasys; Hernandez, Ignacio T.; Kuhlmann, Robert E.; Vande Walle, Donald R., Jr.; Weddell, Ronald P.; Gates, Joseph M.; Sitzwohl, Kenneth J.; Sands, Charles D.; Gwinn, Rick A.; and Peterman, Milton J., 4,549,664, Cl. 211-131.000.
Ludwig, Frank A.; and Helber, Carlyle L., Jr., 4,550,036, Cl. 427-443.100.
Hughes, Donald W. K.: *See*—
Grubb, Daniel B.; and Hughes, Donald W. K., 4,549,343, Cl. 29-33.00M.
Hughes Tool Company - USA: *See*—
Mullins, John M., 4,549,820, Cl. 384-95.000.
Huo, Tai-Chan D.: *See*—
Berkstresser, George W.; Huo, Tai-Chan D.; and Shmulovich, Joseph, 4,550,256, Cl. 250-483.100.
Hurvitz, James S. System for controlling the operation of a camera and projector. 4,549,796, Cl. 352-133.000.
Husak, Zdenek; Svozil, Zdenek; Mazak, Ivan; Lehky, Josef; Hora, Josef; Smid, Zdenek; and Kebrle, Ondrej, to Koh-i-noor Bilovec, norodni podnik. Ice skate. 4,549,742, Cl. 280-11.180.
Hutschenreuter, Elfriede: *See*—
Andrae, Klaus; and Hutschenreuter, Elfriede, 4,550,042, Cl. 428-36.000.
Hutson, Harold K., to Knytex Proform. Biased multi-layer structural fabric composites stitched in a vertical direction. 4,550,045, Cl. 428-102.000.
Huvey, Michel: *See*—
Auberon, Marcel; Cabanel, Daniel; Dolbeau, Michel; Phan, Albert; Pillois, Philippe; Bournazel, Claude L.; and Huvey, Michel, 4,549,919, Cl. 156-172.000.
Hwang, Shih M. Trumpet horn speaker. 4,550,229, Cl. 179-115.50H.
Hydromer, Inc.: *See*—
Lorenz, Donald H., 4,550,126, Cl. 521-159.000.
Hyggen, Egil E., to Elkem a/s. Device for fitting and fixing gripping shoes on vehicle wheels. 4,549,591, Cl. 152-218.000.
I.M.S., Inc.: *See*—
Meyer, Dennis F.; and Schuster, James E., 4,549,498, Cl. 114-145.00A.
I.S.C. Chemicals Limited: *See*—
Sargent, Colin R.; Brierley, Keith; Wotton, David E. M.; and Coe, Paul L., 4,549,686, Cl. 228-242.000.
Ibuki, Yasuhiro: *See*—
Hasegawa, Katsuji; and Ibuki, Yasuhiro, 4,549,587, Cl. 144-209.00R.
Ichikawa, Kaoru: *See*—
Yamamoto, Kunio; Ichikawa, Kaoru; and Moriguchi, Seki, 4,549,681, Cl. 227-8.000.
Idea Engineering Company: *See*—
Brown, Richard L., 4,549,680, Cl. 226-76.000.
Idemitsu Petrochemical Co., Ltd.: *See*—
Isogai, Osamu; and Kagiya, Toshihumi, 4,550,134, Cl. 524-413.000.
Kasahara, Toshikazu; and Nishikawa, Tsutomu, 4,550,145, Cl. 525-267.000.
Tanaka, Kenji; Sugawara, Akinobu; and Yamawaki, Takashi, 4,550,143, Cl. 525-240.000.
Igarashi, Hiroshi, to Fujitsu Limited. FET Power amplifying apparatus. 4,550,290, Cl. 330-149.000.
Ii, Yasuaki: *See*—
Kishida, Kazuo; Sasaki, Isao; Mori, Hiroshi; and Ii, Yasuaki, 4,550,130, Cl. 523-436.000.
Iida, Kazumi; and Ikeda, Kenji, to Yamaha Hatsudoki Kabushiki Kaisha; and Sanshin Kogyo Kabushiki Kaisha. Apparatus for operating an outboard motor. 4,549,869, Cl. 440-84.000.
Iimori, Akiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Electrophotographic apparatus. 4,549,805, Cl. 355-3.0SH.
Ikeda, Kenji: *See*—
Iida, Kazumi; and Ikeda, Kenji, 4,549,869, Cl. 440-84.000.
Ikeda Mohando Co., Ltd.: *See*—
Sugino, Toshiya; Nohara, Fujio; Fujinawa, Tomoaki; Ogawa, Kazuo; Mizukami, Teruo; and Shirai, Shunichi, 4,550,118, Cl. 514-383.000.
Ikeda, Shuji: *See*—
Nagasawa, Kouichi; Ikeda, Shuji; Suzuki, Norio; and Sakai, Yoshio, 4,549,340, Cl. 29-571.000.
Ikeda, Yoshiaki, to Seikosha Co., Ltd. Apparatus for controlling a pulse generator. 4,550,260, Cl. 307-106.000.
Ikegami, Taketoshi: *See*—
Muramoto, Yutaka; and Ikegami, Taketoshi, 4,549,819, Cl. 374-178.000.
Imada, Yosinobu; and Nakashima, Akio, to Hitachi, Ltd. Video disc player skip/arm servo system. 4,550,348, Cl. 358-342.000.
Imai, Masafumi; Yamamoto, Tadashi; Furuhashi, Hiroyuki; Ueno, Hiroshi; and Inaba, Naomi, to Toa Nenryo Kogyo Kabushiki Kaisha. Catalyst component for polymerization of olefins. 4,550,095, Cl. 502-119.000.
Imoto, Masaya: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Naganawa, Hiroshi; Sawa, Tsutomu; Uchida, Takeshi; and Imoto, Masaya, 4,550,159, Cl. 536-6.400.
Imperial Chemical Industries Limited: *See*—
Richardson, Peter J., 4,550,206, Cl. 564-289.000.
Imperial Chemical Industries plc: *See*—
Barlow, Jeffrey J.; and Smith, Leslie H., 4,550,111, Cl. 514-255.000.
Cogswell, Frederic N.; and Hezzell, David J., 4,549,920, Cl. 156-181.000.
Porter, John E.; and Ramshaw, Colin, 4,549,998, Cl. 261-88.000.
Inaba, Naomi: *See*—
Imai, Masafumi; Yamamoto, Tadashi; Furuhashi, Hiroyuki; Ueno, Hiroshi; and Inaba, Naomi, 4,550,095, Cl. 502-119.000.
Inagaki, Sanji, to Minolta Camera Kabushiki Kaisha. Heat roller fixing device. 4,550,243, Cl. 219-216.000.
Inagaki, Tetsuhiko, to Minolta Camera Kabushiki Kaisha. Focus adjusting mechanism for a camera. 4,549,799, Cl. 354-400.000.
Inokuchi, Toshiyuki, to Ricoh Company, Ltd. Optical fiber-guided scanning device. 4,549,784, Cl. 350-96.270.
Inoue, Shunsaku, to Alinco Incorporated. Ladder. 4,549,632, Cl. 182-23.000.
Inoue, Tadashi; and Tanaka, Tetsuro, to Asahi Kasei Kogyo Kabushiki Kaisha. Method and apparatus for dehydration of water-containing substance by electro-osmosis. 4,549,947, Cl. 204-182.400.
Institut CERAC S.A.: *See*—
Hartwig, Carl S. M.; Ljung, Erik A.; and Obel, Erik M., 4,550,282, Cl. 318-808.000.
Institut Francais du Petrole: *See*—
Auberon, Marcel; Cabanel, Daniel; Dolbeau, Michel; Phan, Albert; Pillois, Philippe; Bournazel, Claude L.; and Huvey, Michel, 4,549,919, Cl. 156-172.000.
Douaud, Andre ; and Rialan, Joseph, 4,549,513, Cl. 123-425.000.
Institut Organicheskoi Khimii Akademii Nauk Ukrainskoi SSR: *See*—
Gjulling, Eduard V.; Djugovskaya, Larisa A.; Zabolotny, Dmitry I.; Kovtun, Jury P.; Liptuga, Nikolai I.; Litus, Viktor I.; Sambur, Marina B.; Romanov, Nikolai N.; Tolmachev, Alexei I.; Kirsanov, Alexandr V.; Pisanko, Viktor N.; Melnikov, Oleg F.; and Klochkov, Evgeny I., 4,550,170, Cl. 548-154.000.
International Business Machines Corporation: *See*—
Basi, Jagtar S.; and Mandel, Eric, 4,549,374, Cl. 51-283.00R.
Binnig, Gerd K.; Feenstra, Randall M.; Hodgson, Rodney T.; Rohrer, Heinrich; and Woodall, Jerry M., 4,550,257, Cl. 250-492.200.
Caron, Francois G., 4,550,399, Cl. 370-80.000.
Chellis, Leroy N., 4,550,128, Cl. 523-433.000.
Convis, Danny B.; Grimm, Paul J.; and Reed, Martin A., 4,550,438, Cl. 382-56.000.
Fowler, Alan B., 4,550,330, Cl. 357-16.000.
Goth, George R.; Hansen, Thomas A.; and Makris, James S., 4,549,927, Cl. 156-643.000.
Gruber, Peter A., 4,549,407, Cl. 62-304.000.
Jackson, Thomas N.; Kirchner, Peter D.; Pettit, George D.; Rosenberg, James J.; Woodall, Jerry M.; and Wright, Steven L., 4,550,047, Cl. 428-136.000.
Lowin, Anne-Marie; and Wight, Eleanor G., 4,549,500, Cl. 116-240.000.
Sachdev, Krishna G.; and Aviram, Ari, 4,549,824, Cl. 400-241.100.

Sachdev, Krishna G.; Shear, Stephen A.; Pennington, Keith S.; and Cohen, Mitchell S., 4,550,061, Cl. 428-461.000.

International Flavors & Fragrances Inc.: *See*—
Evers, William J.; Mookherjee, Braja D.; Van Ouwerkerk, Anton; and Van Loveren, Augustinus G., 4,549,972, Cl. 252-8.600.
Hall, John B.; Sprecker, Mark A.; Belko, Robert P.; Van Loveren, Augustinus G.; and Hanna, Marie R., 4,549,982, Cl. 252-522.00R.
Mookherjee, Braja D.; Trenkle, Robert W.; Wolff, Robin K.; Boden, Richard M.; and Yoshida, Takao, 4,549,971, Cl. 252-8.600.
Wiegers, Wilhelmus J.; and Sprecker, Mark A., 4,549,983, Cl. 252-522.00R.

International Jensen Incorporated: *See*—
Johnson, William K., 4,550,230, Cl. 179-178.000.

International Power Technology, Inc.: *See*—
Cheng, Dah Y., 4,549,397, Cl. 60-39.300.

International Standard Electric Corporation: *See*—
Uebel, Helmut, 4,550,444, Cl. 455-41.000.

Interstate Electronics Corporation: *See*—
Weber, Larry F., 4,550,274, Cl. 315-169.400.

Inukai, Tadahiko: *See*—
Yamada, Hideaki; Otsuji, Shogo; Isobe, Kimiyasu; Matsunaga, Kuniyoshi; and Inukai, Tadahiko, 4,550,078, Cl. 435-25.000.

Iowa State University Research Foundation, Inc.: *See*—
Anderson, Lloyd L.; and Girard, Leon E., 4,549,501, Cl. 119-99.000.

Isaacs, Robert B., to Northern Telecom Limited. Connecting member for connecting two communications terminal units. 4,549,776, Cl. 312-111.000.

Ishida, Kazuhiro: *See*—
Toyooka, Takashi; Yoshida, Kazutoshi; Ishida, Kazuhiro; Okahashi, Tatsuo; Aoki, Hirokazu; Suzuki, Ryo; and Sugita, Yutaka, 4,550,388, Cl. 365-6.000.

Ishige, Ryohei, to Hitachi, Ltd. Container storage shed installation. 4,549,841, Cl. 414-282.000.

Ishizuka, Yutaka; and Shibuya, Tsunenori, to Diesel Kiki Company, Ltd. Compression capacity control apparatus for swash plate compressor. 4,549,855, Cl. 417-270.000.

Isobe, Kimiyasu: *See*—
Yamada, Hideaki; Otsuji, Shogo; Isobe, Kimiyasu; Matsunaga, Kuniyoshi; and Inukai, Tadahiko, 4,550,078, Cl. 435-25.000.

Isobe, Toshiaki: *See*—
Ito, Toshimitsu; Isobe, Toshiaki; and Hattori, Takashi, 4,550,373, Cl. 364-431.040.

Isogai, Osamu; and Kagiya, Toshihumi, to Idemitsu Petrochemical Co., Ltd. Polyolefin resin composition. 4,550,134, Cl. 524-413.000.

Isozaki, Akio: *See*—
Sato, Yoshiyuki; and Isozaki, Akio, 4,549,606, Cl. 165-179.000.

Isumi, Kenzo: *See*—
Tachibana, Eiichi; Murayama, Koushou; and Isumi, Kenzo, 4,549,923, Cl. 156-423.000.

Ito, Tetsuo: *See*—
Suminoe, Taro; Ito, Tetsuo; Kiyomatsu, Yasuhiro; and Shimizu, Takao, 4,550,001, Cl. 264-2.600.

Ito, Toshimitsu; Isobe, Toshiaki; and Hattori, Takashi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Temperature-feedback electronic engine control apparatus and method. 4,550,373, Cl. 364-431.040.

Itoh, Isamu: *See*—
Miyasaka, Tsutomu; Kobayashi, Hidetoshi; Itoh, Isamu; and Hirano, Shigeo, 4,550,070, Cl. 430-202.000.

ITT Industries, Inc.: *See*—
Kahrs, Manfred, 4,550,372, Cl. 364-426.000.

Ivey, Alma T. Jewelry chain organizer. 4,549,411, Cl. 63-2.000.

Iwama, Satoshi; and Hashiyama, Mitsuaki, to Toyo Tire & Rubber Co., Ltd. Tire rubber composition. 4,550,135, Cl. 524-495.000.

Izumitani, Tetsuro; Takajoh, Toshi; and Kinjo, Iwao, to Hoya Corporation. Method and apparatus for melting glass. 4,549,895, Cl. 65-134.000.

J. Wagner GmbH: *See*—
Kille, Ewald; and Griebel, Heinrich, 4,550,266, Cl. 310-19.000.

Jaccod, Jean-Claude: *See*—
Trintignac, Christian; and Jaccod, Jean-Claude, 4,549,468, Cl. 91-361.000.

Jackel, Lawrence D.: *See*—
Damen, Theodoor C.; Duguay, Michael A.; Howard, Richard E.; Jackel, Lawrence D.; and Skocpol, William J., 4,550,249, Cl. 250-201.000.

Jackson Enterprises: *See*—
Castilano, Charles R., 4,549,723, Cl. 254-405.000.

Jackson, Thomas N.; Kirchner, Peter D.; Pettit, George D.; Rosenberg, James J.; Woodall, Jerry M.; and Wright, Steven L., to International Business Machines Corporation. Silicon source component for use in molecular beam epitaxial growth apparatus. 4,550,047, Cl. 428-136.000.

Jacob, Solomon M.: *See*—
Garwood, William E.; Kuo, James C.; Jacob, Solomon M.; and Wise, John J., 4,549,396, Cl. 60-39.020.

Jagusch, Peter R.; and Novak, W. Thomas, to Micronix Partners. Mask loading apparatus, method and cassette. 4,549,843, Cl. 414-416.000.

James, Donald R., to Stauffer Chemical Company. 2-[4-(Substituted aryl)phenoxy]-N-substituted-phenylsulfonyl propionamides having herbicidal properties. 4,549,901, Cl. 71-94.000.

Janitschke, Lothar; and Hoffmann, Werner, to BASF Aktiengesellschaft. Preparation of compounds of the 4-oxodamascone series, and novel scents from this class of compounds. 4,550,211, Cl. 568-361.000.

Janssen, Harry R.: *See*—
Graf, Harlan G.; Janssen, Harry R.; and Kurdy, George A., 4,549,934, Cl. 196-98.000.

Japan Synthetic Rubber Co., Ltd.: *See*—
Suminoe, Taro; Ito, Tetsuo; Kiyomatsu, Yasuhiro; and Shimizu, Takao, 4,550,001, Cl. 264-2.600.

Jastrzebski, Lubomir L.: *See*—
Corboy, John F., Jr.; Jastrzebski, Lubomir L.; Blackstone, Scott C.; and Pagliaro, Robert H., Jr., 4,549,926, Cl. 156-612.000.

Jaworski, James F.: *See*—
Prengaman, Richard J.; Thurber, Robert E.; Phipps, Joe; Greenberg, Ronald I.; Hom, Wai L.; Jaworski, James F.; and Riffle, Guy W., 4,550,318, Cl. 343-5.0PD.

Jencks, Charles L.; and Castonguay, Roger N., to General Electric Company. Latch release mechanism for molded case electric circuit breakers. 4,550,300, Cl. 335-16.000.

Jensen, Carl A.; and Rasmussen, Ib O., to C. C. Jensen A/S. Filtering device comprising one or more filtering elements consisting of filtering discs. 4,549,963, Cl. 210-314.000.

Jensen, James W., Jr., to Adolph Coors Company. Die cut window laminating device. 4,549,917, Cl. 156-108.000.

Jensen, Jens C., to Pocal Industries, Inc. Practice projectile with variable range. 4,549,487, Cl. 102-498.000.

Jensen, Niels D.; and Nielsen, Kurt F., to Grundfos A/S. Pumping assemblies. 4,549,849, Cl. 415-219.00R.

Jiandani, Niranjan T., to Spirax Sarco, Inc. Dual mode bellows-actuated thermostatic steam trap. 4,549,691, Cl. 236-58.000.

Jidosha Kiki Co., Ltd.: *See*—
Takeshima, Sadao; and Ohe, Takeshi, 4,549,627, Cl. 180-142.000.

Joannou, Constantinos J. Electronic air filter. 4,549,887, Cl. 55-131.000.

Jobst, Lothar, to BHS-Bayerische Berg-, Hutten- und Salzwerke Aktiengesellschaft. Apparatus for removing edge strips cut off in longitudinal slitting and grooving machines. 4,549,452, Cl. 83-100.000.

Joh. A. Benckiser Wassertechnik GmbH: *See*—
Bellemann, Rudolf; Diehlmann, Rolf; Dobrocsi, Bela; and Wacker, Karl F., 4,549,961, Cl. 210-108.000.

Johannes Heidenhain GmbH: *See*—
Ernst, Alfons, 4,549,356, Cl. 33-169.00R.

John Wyeth & Brother limited: *See*—
White, John F., 4,550,114, Cl. 514-294.000.

Johns Hopkins University, The: *See*—
Prengaman, Richard J.; Thurber, Robert E.; Phipps, Joe; Greenberg, Ronald I.; Hom, Wai L.; Jaworski, James F.; and Riffle, Guy W., 4,550,318, Cl. 343-5.0PD.

Johnson, Donald L. Snow removing attachment for automotive vehicles. 4,549,365, Cl. 37-251.000.

Johnson & Johnson Baby Products Company: *See*—
Lindemann, Martin K. O.; and Lukenbach, Elvin R., 4,550,193, Cl. 560-147.000.

Johnson & Johnson Products, Inc.: *See*—
Lauritzen, Nels J., 4,549,653, Cl. 206-441.000.

Johnson, Kenneth L., to Capmakers, Ltd. Foldable hat. 4,549,316, Cl. 2-195.000.

Johnson, Milton D.; and Chattha, Mohinder S., to Ford Motor Company. Organophosphorus enamines useful as epoxy curatives and adhesion promoters. 4,550,201, Cl. 564-15.000.

Johnson, Philip M.: *See*—
Dalton, Jeffrey L.; and Johnson, Philip M., 4,550,059, Cl. 428-409.000.

Johnson, Robert M. Cleaner and chalk dust receptacle for chalk board erasers. 4,549,327, Cl. 15-236.00R.

Johnson, Ronald E.: *See*—
Blanding, Wendell S.; Johnson, Ronald E.; and VanDewoestine, Robert V., 4,549,928, Cl. 156-660.000.

Johnson, Roy B., deceased (by Johnson, Wilma J., legal representative); and Ristvedt, Victor G., to Ristvedt-Johnson, Inc. Coin handling machine. 4,549,561, Cl. 133-3.00A.

Johnson Service Company: *See*—
Beeson, Charles F., 4,549,446, Cl. 74-625.000.

Johnson, William K., to International Jensen Incorporated. Speaker grille with snap-in fastener system. 4,550,230, Cl. 179-178.000.

Johnson, Wilma J., legal representative: *See*—
Johnson, Roy B., deceased; and Ristvedt, Victor G., 4,549,561, Cl. 133-3.00A.

Johnston, Albert D., to General Motors Corporation. Roller clutch adjustable force spring mount. 4,549,638, Cl. 192-45.000.

Jones, Hoxie D., Sr. Apparatus and method for quick release mechanism for animal trap. 4,549,367, Cl. 43-88.000.

Jones, James F.; and Starr, John B., Jr., to General Electric Co. Preparation of branched polycarbonates by transesterification with a triaryl tricarboxylic acid branching agent. 4,550,155, Cl. 528-176.000.

Joshi, David; and Klingaman, Richard, to Colgate-Palmolive Company. Bottled particulate detergent. 4,549,977, Cl. 252-90.000.

Judd, Michael; and Cooper, Joseph S., to Thermo Electron Corporation. Doctor blade with non-homogeneous stiffness properties. 4,549,933, Cl. 162-281.000.

Justus, Edgar J., to Beloit Corporation. Continuous counterflow belt washer. 4,549,415, Cl. 68-158.000.

K. L. Spring & Stamping Corporation: *See*—
Haedo, Edmundo, 4,549,764, Cl. 297-296.000.

Kaalstad, Oscar W.; and Reid, Neil G., to Engtech SA. Drilling device. 4,549,614, Cl. 175-339.000.

Kabashima, Katsuhiko; Takemae, Yoshihiro; Nozaki, Shigeki; Ohira, Tsuyoshi; Miyahara, Hatsuo; Kanai, Masakazu; and Enomoto, Seiji, to Fujitsu Limited. Semiconductor integrated circuit device. 4,550,289, Cl. 324-158.00R.

Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
Fujiwara, Atsushi, 4,549,619, Cl. 177-25.000.
Kono, Katsuaki, 4,549,618, Cl. 177-25.000.
Matsumoto, Seishi; Nakashimizu, Takeo; and Abe, Yuji, 4,549,617, Cl. 177-1.000.
Ueda, Kenji, 4,549,621, Cl. 177-105.000.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
Sato, Yoshiyuki; and Isozaki, Akio, 4,549,606, Cl. 165-179.000.

kabushiki Kaisha Komatsu Seisakusho: *See*—
Hoashi, Kenzo; and Uehara, Kazuo, 4,549,466, Cl. 91-6.500.

Kabushiki Kaisha Myotoku: *See*—
Yamamoto, Shoii, 4,549,854, Cl. 417-187.000.

Kagiya, Toshihumi: *See*—
Isogai, Osamu; and Kagiya, Toshihumi, 4,550,134, Cl. 524-413.000.

Kahn, John H.: *See*—
Murib, Jawad H.; and Kahn, John H., 4,550,181, Cl. 549-326.000.

Kahrs, Manfred, to ITT Industries, Inc. Control system for a vehicular braking system incorporating a hydrodynamic brake and a friction brake. 4,550,372, Cl. 364-426.000.

Kaizyo, Shuichi: *See*—
Endo, Mitsushi; Taniguchi, Toshiaki; Sahara, Teruyoshi; Hayakawa, Noriyuki; Yoshitomi, Tatsuo; Takahashi, Kozo; Nagatani, Yoshiteru; Kawai, Hidenao; Kaizyo, Shuichi; Nakagawa, Yoichi; Yamagami, Kazuo; Takizawa, Teruo; and Suzuki, Tomio, 4,549,472, Cl. 98-34.600.

Kakumoto, Shigeru: *See*—
Shimada, Shigeru; Kakumoto, Shigeru; and Abe, Osamu, 4,550,434, Cl. 382-9.000.

Kalfayan, Leonard J.: *See*—
Watkins, David R.; Knight, Robert K.; Young, Donald C.; and Kalfayan, Leonard J., 4,549,609, Cl. 166-303.000.

Kali-Chemie Pharma GmbH: *See*—
Schoen, Uwe; Hachmeister, Bernd; Kehrbach, Wolfgang; Kuehl, Ulrich; and Buschmann, Gerd, 4,550,112, Cl. 514-278.000.

Kallestad Laboratories, Inc.: *See*—
Bacquet, Cathy A.; and Twumasi, Daniel Y., 4,550,075, Cl. 435-7.000.

Kalsi, Manmohan S.: *See*—
Saunders, Donna D.; Kalsi, Manmohan S.; and Chen, Gun-Shing, 4,549,754, Cl. 285-334.000.

Kalz, Dietmar: *See*—
Morris, Susan M.; Thomas, Thomas J.; and Kalz, Dietmar, 4,549,980, Cl. 252-301.230.

Kameo, Yuji: *See*—
Toda, Yuichi; Sakamoto, Katsuji; Tanaka, Shigeru; and Kameo, Yuji, 4,549,391, Cl. 57-13.000.

Kami, Tomohiro, to Matsushita Electric Works, Ltd. Sphygmomanometer. 4,549,550, Cl. 128-686.000.

Kamiyama, Shuichi, to Mikuni Kogyo Kabushiki Kaisha. Fuel supply device for internal combustion engines. 4,549,517, Cl. 123-478.000.

Kamohara, Hiroshi: *See*—
Ohi, Nobukazu; Ohno, Koji; and Kamohara, Hiroshi, 4,550,030, Cl. 427-2.000.

Kanai, Masakazu: *See*—
Kabashima, Katsuhiko; Takemae, Yoshihiro; Nozaki, Shigeki; Ohira, Tsuyoshi; Miyahara, Hatsuo; Kanai, Masakazu; and Enomoto, Seiji, 4,550,289, Cl. 324-158.00R.

Kanasugi, Mikiko: *See*—
Gonda, Michihiro; Kitsukawa, Katsumasa; Suzuka, Susumu; Kanasugi, Mikiko; Sato, Yutaka; and Otomo, Kikuo, 4,550,329, Cl. 346-214.000.

Kanda, Yohichi: *See*—
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizu, Susumu; Watanabe, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,549,902, Cl. 71-90.000.

Kane, Richard E.: *See*—
Bolin, Philip C.; Bowman, Gary K.; Ellis, Charles S.; Hopkins, Melvyn D.; and Kane, Richard E., 4,550,219, Cl. 174-21.00C.

Kanehara, Kenji: *See*—
Tokura, Norihito; Kawai, Hisasi; Kohama, Tokio; and Kanehara, Kenji, 4,550,308, Cl. 340-347.0NT.

Kanno, Kohei: *See*—
Ohtsu, Yoichi; Kanno, Kohei; and Nagano, Hiroshi, 4,550,007, Cl. 264-521.000.

Karl Lautenschlager KG Mobelbeschlagfabrik: *See*—
Lautenschlager, Karl, Jr., 4,549,831, Cl. 403-231.000.

Karlen, Urs; Putzar, Roland; and Schaulin, Rudolf, to Ciba Geigy Corporation. Dye mixture of 1,4-diamino anthraquinone-N-gamma-methoxy propyl-2,3-dicarboximide and 1,4-diamino anthraquinone-N-methoxyethoxy propyl-2,3-dicarboximide, processes for producing it, useful for dyeing and printing hydrophobic fiber materials. 4,550,178, Cl. 548-426.000.

Karlinsky, David: *See*—
Meshman, Boris; Kerekes, Thomas A.; Green, Lawrence S.; and Karlinsky, David, 4,550,374, Cl. 364-490.000.

Karlsson, Gunvor B. T.: *See*—
Mathiesen, Mait M.; Gillberg, Lars I.; Hellsten, Karl M. E.; and Karlsson, Gunvor B. T., 4,549,881, Cl. 44-51.000.

Karman, James D.: *See*—
West, John D.; Trainor, James E.; and Karman, James D., 4,550,244, Cl. 219-158.000.

Karning, Heinrich; Prein, Franz; and Vierling, Karl-Heinz. Method and apparatus for operating a gas laser. 4,550,408, Cl. 372-58.000.

Karrenbauer, Michael; Kleemann, Axel; Lussling, Theodor; and Schafer, Fritz, to Degussa Aktiengesellschaft. Process for obtaining D,L-homocystine (I). 4,550,199, Cl. 562-556.000.

Karrenbauer, Michael; Kleemann, Axel; Lussling, Theodor; and Schafer, Fritz, to Degussa Aktiengesellschaft. Process for obtaining D,L-homocystine (II). 4,550,200, Cl. 562-556.000.

Karwan, Steven J. Method for surface treating copper foil. 4,549,940, Cl. 204-13.000.

Kasabian, George, to Garrett Corporation, The. Method for producing a permanent magnet rotor. 4,549,341, Cl. 29-598.000.

Kasahara, Toshikazu; and Nishikawa, Tsutomu, to Idemitsu Petrochemical Co., Ltd. Process for the production of propylene block copolymers by a three step method. 4,550,145, Cl. 525-267.000.

Kasai, Junichi: *See*—
Yanagishima, Takayuki; Kasai, Junichi; Ajimine, Akio; Watanabe, Tatsuya; Shino, Akimitsu; and Murakami, Yoshiaki, 4,550,428, Cl. 381-86.000.

Katakabe, Noboru: *See*—
Watanabe, Shuichi; and Katakabe, Noboru, 4,550,302, Cl. 335-228.000.

Kataoka, Hiroshi, to Asahi Kasei Kogyo Kabushiki Kaisha. Acrylic sheets. 4,550,057, Cl. 428-215.000.

Kato, Heizaburo, to Sankyo Manufacturing Company, Ltd. Roll feed apparatus. 4,549,683, Cl. 226-142.000.

Kato, Kiminari, to NGK Insulators, Ltd. Extrusion die for ceramic honeycomb structure. 4,550,005, Cl. 264-177.00R.

Kato, Toyoaki: *See*—
Ando, Takehiro; Miyake, Shuji; Murakami, Osamu; Kawabata, Takashi; Hayashi, Shigeo; Otonari, Michiyasu; and Kato, Toyoaki, 4,549,835, Cl. 405-4.000.

Katz, Philip; Brenman, Henry S.; Lowry, Louis D.; and Schwartz, Harold, to Thomas Jefferson University. Artificial larynx. 4,550,427, Cl. 381-70.000.

Kaufman, Vernon R., to Tecumseh Products Company. Yoke thrust bearing for a piston and connecting rod assembly. 4,549,445, Cl. 74-579.00R.

Kauserud, Hakon, to Dansk Industri Syndikat A/S. Plant for the production of castings in a stepwise advanced casting mould consisting of identical, flaskless mould parts. 4,549,600, Cl. 164-323.000.

Kawabata, Takashi: *See*—
Ando, Takehiro; Miyake, Shuji; Murakami, Osamu; Kawabata, Takashi; Hayashi, Shigeo; Otonari, Michiyasu; and Kato, Toyoaki, 4,549,835, Cl. 405-4.000.

Kawada, Yasuyuki: *See*—
Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Junichi; and Ukigai, Toshiyuki, 4,549,607, Cl. 166-274.000.

Kawai, Hidenao: *See*—
Endo, Mitsushi; Taniguchi, Toshiaki; Sahara, Teruyoshi; Hayakawa, Noriyuki; Yoshitomi, Tatsuo; Takahashi, Kozo; Nagatani, Yoshiteru; Kawai, Hidenao; Kaizyo, Shuichi; Nakagawa, Yoichi; Yamagami, Kazuo; Takizawa, Teruo; and Suzuki, Tomio, 4,549,472, Cl. 98-34.600.

Kawai, Hisasi: *See*—
Tokura, Norihito; Kawai, Hisasi; Kohama, Tokio; and Kanehara, Kenji, 4,550,308, Cl. 340-347.0NT.

Kawai, Kensuke; and Tanaka, Shuntaro, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of electric power plant operation. 4,550,379, Cl. 364-494.000.

Kawai, Kiyoshi: *See*—
Hanji, Katsumi; and Kawai, Kiyoshi, 4,550,094, Cl. 502-110.000.

Kawai Musical Instrument Mfg. Co., Ltd.: *See*—
Deutsch, Ralph, 4,549,459, Cl. 84-1.010.

Kawakami, Toshiro, to Aisin Seiki Kabushiki Kaisha. Foil bearing. 4,549,821, Cl. 384-103.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Tamba, Shinichi; and Mitadera, Takashi, 4,549,520, Cl. 123-572.000.

Kaye, Alan S., to United Kingdom Atomic Energy Authority. Induced flow gas transport laser. 4,550,409, Cl. 372-59.000.

Kazama, Munetada: *See*—
Ayusawa, Kazutoshi; Satoh, Hosaku; and Kazama, Munetada, 4,550,089, Cl. 501-139.000.

Kebrle, Ondrej: *See*—
Husak, Zdenek; Svozil, Zdenek; Mazak, Ivan; Lehky, Josef; Hora, Josef; Smid, Zdenek; and Kebrle, Ondrej, 4,549,742, Cl. 280-11.180.

Keen, Harry J.; and Barrett, L. Paul, to Colt Industries Operating Corp. Moistureproof load cell for food processing applications and method for making the same. 4,549,439, Cl. 73-862.650.

Kehrbach, Wolfgang: *See*—
Schoen, Uwe; Hachmeister, Bernd; Kehrbach, Wolfgang; Kuehl, Ulrich; and Buschmann, Gerd, 4,550,112, Cl. 514-278.000.

Kelly, Michael G.; and Covill, James H., to American Hoechst Corporation. Soil repellents derived from fluorinated acrylates and aromatic amines. 4,550,189, Cl. 560-044.000.

Kelly, P. Richard; and Pedersen, John N., to Telectronics Pty. Ltd. Bone growth stimulator. 4,549,546, Cl. 128-419.00F.

Kelly, Samuel T., to RobertShaw Controls Company. Fuel control valve construction, parts therefor and methods of making the same. 4,549,571, Cl. 137-489.500.

Kempe, Uwe: *See*—
Dockner, Toni; Kempe, Uwe; and Frank, Anton, 4,550,176, Cl. 548-343.000.

Kemper, John M. Tire changer adapter. 4,549,595, Cl. 157-1.000.

Kennametal Inc.: *See*—
Liang, Dah-Ben; and Gulibon, Robert S., 4,549,615, Cl. 175-389.000.

Kenworthy, James S.; and Kozinski, Thomas G., to PPG Industries, Inc. Photoelectroforming mandrel and method of electroforming. 4,549,939, Cl. 204-4.000.

Keppel, Stephen C., to St. Regis Paper Company. Vented bag. 4,550,441, Cl. 383-103.000.

Keptel, Inc.: *See*—
Lynch, Daniel; and Perry, Steven B., 4,550,225, Cl. 179-81.00R.

Kerekes, Thomas A.: *See*—
Meshman, Boris; Kerekes, Thomas A.; Green, Lawrence S.; and Karlinsky, David, 4,550,374, Cl. 364-490.000.

Kerko, David J.; Morgan, David W.; and Thompson, Richard W., to Corning Glass Works. Photochromic comfort glasses. 4,550,087, Cl. 501-13.000.

Kerko, David J.: *See*—
Araujo; Roger J.; Hares, George B.; Kerko, David J.; Morgan, David W.; and Morse, David L., 4,549,894, Cl. 65-30.110.

Kerr, Paul R.: *See*—
Makhlouf, Joseph M.; McCollum, Gregory J.; and Kerr, Paul R., 4,550,060, Cl. 428-423.100.

Keyes, Marion A., IV; Lukas, Michael P.; and Moss, William H., to Babcock & Wilcox Company, The. Maximum efficiency steam temperature control system. 4,549,503, Cl. 122-479.00R.

Kievsky Nauchno-Issledovatelsky Institut Otolaringologii: *See*—
Gjulling, Eduard V.; Djugovskaya, Larisa A.; Zabolotny, Dmitry I.; Kovtun, Jury P.; Liptuga, Nikolai I.; Litus, Viktor I.; Sambur, Marina B.; Romanov, Nikolai N.; Tolmachev, Alexei I.; Kirsanov, Alexandr V.; Pisanko, Viktor N.; Melnikov, Oleg F.; and Klochkov, Evgeny I., 4,550,170, Cl. 548-154.000.

Kile, H. Buford, to Fabrication Center, Inc. Apparatus and method for producing patterned tufted goods. 4,549,496, Cl. 112-79.500.

Kille, Ewald; and Griebel, Heinrich, to J. Wagner GmbH. Reciprocating armature motor for driving electrical equipment. 4,550,266, Cl. 310-19.000.

Kimball, Stephen F.; Audesse, Emery G.; and Griffin, Robert M., to GTE Products Corporation. Tungsten halogen lamp having a fine-wire filament and a hydrogen-impervious envelope. 4,550,270, Cl. 313-579.000.

Kimura, Hidetoshi, to Murata Kikai Kabushiki Kaisha. Yarn splicing device for spun yarns. 4,549,392, Cl. 57-22.000.

Kimura, Kiyoshi, to Alps Electric Co., Ltd. Touch system coordinates input apparatus. 4,550,384, Cl. 364-556.000.

Kimura, Mitsutoshi; and Morita, Masayuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Operating circuit for electric discharge lamp. 4,550,272, Cl. 315-86.000.

Kimura, Takahiko: *See*—
Takao, Mitsunori; Kimura, Takahiko; and Hirabayashi, Yuzi, 4,549,512, Cl. 123-339.000.

Kimura, Tetsuo, to Nittan Company, Limited. Signal transmission system for fire alarm junction line. 4,550,306, Cl. 340-310.00R.

Kimura, Tetsuo, to Nittan Company, Limited. Fire detecting system. 4,550,313, Cl. 340-584.000.

King, Alex C. Electro-hydraulic engine throttle control. 4,549,400, Cl. 60-394.000.

King Instrument Corporation: *See*—
Goguen, Louis J., 4,549,925, Cl. 156-506.000.

Kingsford-Smith, Charles: *See*—
Hiller, Donald R.; and Kingsford-Smith, Charles, 4,550,309, Cl. 340-347.0AD.

Kinjo, Iwao: *See*—
Izumitani, Tetsuro; Takajoh, Toshi; and Kinjo, Iwao, 4,549,895, Cl. 65-134.000.

Kinkelaar, Edmund W.; and Pekar, Howard G., to Texo Corporation. Tin plating immersion process. 4,550,037, Cl. 427-443.100.

Kirchner, Peter D.: *See*—
Jackson, Thomas N.; Kirchner, Peter D.; Pettit, George D.; Rosenberg, James J.; Woodall, Jerry M.; and Wright, Steven L., 4,550,047, Cl. 428-136.000.

Kirsanov, Alexandr V.: *See*—
Gjulling, Eduard V.; Djugovskaya, Larisa A.; Zabolotny, Dmitry I.; Kovtun, Jury P.; Liptuga, Nikolai I.; Litus, Viktor I.; Sambur, Marina B.; Romanov, Nikolai N.; Tolmachev, Alexei I.; Kirsanov, Alexandr V.; Pisanko, Viktor N.; Melnikov, Oleg F.; and Klochkov, Evgeny I., 4,550,170, Cl. 548-154.000.

Kirsch, Warren B., to Ethyl Corporation. Decolorization of calcium bromide brines. 4,549,973, Cl. 252-8.55R.

Kirtley, James L., Jr.: *See*—
Walker, Gary E.; Spiegel, Leo; Shuman, Anthony J.; and Kirtley, James L., Jr., 4,550,228, Cl. 179-115.00V.

Kishi, Yoshiki; Hirotani, Toyotoshi; Ohira, Tomohiro; and Fukui, Yukio, to Director-General of Agency of Industrial Science and Technology. Pattern indication using laser beam. 4,550,294, Cl. 332-7.510.

Kishida, Kazuo; Sasaki, Isao; Mori, Hiroshi; and Ii, Yasuaki, to Mitsubishi Rayon Co., Ltd. Composite material with improved properties. 4,550,130, Cl. 523-436.000.

Kishimoto, Shoji: *See*—
Matsuo, Taisuke; Kishimoto, Shoji; and Ochiai, Michihiko, 4,550,105, Cl. 514-210.000.

Kitada, Yoshitaka: *See*—
Akashi, Mineo; and Kitada, Yoshitaka, 4,550,307, Cl. 340-347.0DA.

Kitasato Institute, The: *See*—
Umezawa, Iwao; and Komiyama, Kanki, 4,550,021, Cl. 424-122.000.

Kitchener, John A.: *See*—
Cash, John; and Kitchener, John A., 4,549,856, Cl. 417-295.000.

Kitchens, Roy A., to National Industries, Inc. Splice insulator assembly. 4,550,220, Cl. 174-138.00F.

Kitsukawa, Katsumasa: *See*—
Gonda, Michihiro; Kitsukawa, Katsumasa; Suzuka, Susumu; Kanasugi, Mikiko; Sato, Yutaka; and Otomo, Kikuo, 4,550,329, Cl. 346-214.000.

Kittle, Carl E., to Deere & Company. Differential lock control system responsive to a plurality of vehicle parameters. 4,549,448, Cl. 74-710.500.

Kiyomatsu, Yasuhiro: *See*—
Suminoe, Taro; Ito, Tetsuo; Kiyomatsu, Yasuhiro; and Shimizu, Takao, 4,550,001, Cl. 264-2.600.

Klauke, Erich: *See*—
Forster, Heinz; Klauke, Erich; Eue, Ludwig; Schmidt, Robert R.; and Lurssen, Klaus, 4,549,899, Cl. 71-90.000.
Hagemann, Hermann; Klauke, Erich; and Kysela, Ernst, 4,549,994, Cl. 260-544.00F.

Kleemann, Axel: *See*—
Karrenbauer, Michael; Kleemann, Axel; Lussling, Theodor; and Schafer, Fritz, 4,550,199, Cl. 562-556.000.
Karrenbauer, Michael; Kleemann, Axel; Lussling, Theodor; and Schafer, Fritz, 4,550,200, Cl. 562-556.000.

Klein, Eric, to Fabriques D'horlogerie De Fontainemelon S.A. Step-by-step motor unit. 4,550,279, Cl. 318-696.000.

Kliklok Corporation: *See*—
Baker, Thomas R.; Hittenberger, William H.; and Posen, Boris J., 4,549,876, Cl. 493-169.000.

Klingaman, Richard: *See*—
Joshi, David; and Klingaman, Richard, 4,549,977, Cl. 252-90.000.

Klochkov, Evgeny I.: *See*—
Gjulling, Eduard V.; Djugovskaya, Larisa A.; Zabolotny, Dmitry I.; Kovtun, Jury P.; Liptuga, Nikolai I.; Litus, Viktor I.; Sambur, Marina B.; Romanov, Nikolai N.; Tolmachev, Alexei I.; Kirsanov, Alexandr V.; Pisanko, Viktor N.; Melnikov, Oleg F.; and Klochkov, Evgeny I., 4,550,170, Cl. 548-154.000.

Klocker, Leo. Device for shaving wood with cylinder saws. 4,549,586, Cl. 144-3.00R.

Kluver, Leroy: *See*—
Groeneveld, Wilbur E.; Kluver, Leroy; and Vincent, Michael T., 4,549,481, Cl. 100-98.00R.

Klyatis, Lev M.: *See*—
Minenko, Leonid; Belikov, Evgeny V.; Bobryshev, Oleg V.; Klyatis, Lev M.; Mescheryakov, Ivan K.; Osipov, Viktor G.; Osher, Mikhail I.; and Plyakin, Nikolai P., 4,549,760, Cl. 294-88.000.

Knape & Vogt Manufacturing Company: *See*—
Bessinger, Walter L.; and Hoffman, Keith A., 4,549,774, Cl. 308-3.800.

Knapp, Gordon G., to Ethyl Corporation. Corrosion inhibitors for alcohol containing fuels. 4,549,882, Cl. 44-53.000.

Knapp, Gordon G., to Ethyl Corporation. Fuel compositions. 4,549,885, Cl. 44-57.000.

Knifton, John F.: *See*—
Unvert, Susan D.; Vanderpool, Steven H.; and Knifton, John F., 4,550,209, Cl. 564-479.000.

Knight, Robert K.: *See*—
Watkins, David R.; Knight, Robert K.; Young, Donald C.; and Kalfayan, Leonard J., 4,549,609, Cl. 166-303.000.

Knudson, Mark B.; Sembrowich, Walter L.; and Guruswamy, Vinodhini, to SenTech Medical Corporation. Ion selective electrode. 4,549,951, Cl. 204-416.000.

Knytex Proform: *See*—
Hutson, Harold K., 4,550,045, Cl. 428-102.000.

Kobashi, Kiyoshi: *See*—
Oishi, Kiyohiko; Kobashi, Kiyoshi; and Takama, Kenichirou, 4,549,398, Cl. 60-286.000.

Kobayashi, Hidetoshi: *See*—
Miyasaka, Tsutomu; Kobayashi, Hidetoshi; Itoh, Isamu; and Hirano, Shigeo, 4,550,070, Cl. 430-202.000.

Kobayashi, Kouji: *See*—
Takayama, Suguru; Noguchi, Kiyoshi; and Kobayashi, Kouji, 4,550,062, Cl. 428-611.000.

Kobayashi, Nobuo: *See*—
Hirosawa, Toshio; Ohki, Masaru; Miyazaki, Katuto; Kobayashi, Nobuo; and Koizumi, Naoko, 4,550,386, Cl. 364-900.000.

Kobayashi, Taishi: *See*—
Takamizawa, Minoru; Kobayashi, Taishi; Hayashida, Akira; and Takeda, Yoshihumi, 4,550,151, Cl. 528-7.000.

Kobayashi, Tetsuo: *See*—
Hirai, Osamu; Kobayashi, Tetsuo; Kuwatsuka, Shunichiro; and Suzuki, Saburo, 4,550,353, Cl. 360-125.000.

Kobayashi, Tetsuya: *See*—
Nunogaki, Yoshiaki; Kobayashi, Tetsuya; and Kosuge, Yasutaka, 4,550,417, Cl. 377-10.000.

Kobayashi, Yoshiki; and Fukushima, Tadashi, to Hitachi, Ltd. Apparatus for parallel processing of local image data. 4,550,437, Cl. 382-41.000.

Koch, Manfred; and Maier, Thomas, to Hoechst Aktiengesellschaft. Process for reducing the proportions of by products in the preparation of carbendazim. 4,550,174, Cl. 548-306.000.

Kochy, Fritz B.; and Bayer, Hermann, to General Motors Corporation. Defroster system for use in motor vehicles. 4,549,471, Cl. 98-2.090.

Koelsch, Lester M., to Envirex Inc. Rotating biological contactor. 4,549,962, Cl. 210-150.000.

Koh-i-noor Bilovec, norodni podnik: *See*—
Husak, Zdenek; Svozil, Zdenek; Mazak, Ivan; Lehky, Josef; Hora, Josef; Smid, Zdenek; and Kebrle, Ondrej, 4,549,742, Cl. 280-11.180.

Kohama, Tokio: *See*—
Tokura, Norihito; Kawai, Hisasi; Kohama, Tokio; and Kanehara, Kenji, 4,550,308, Cl. 340-347.0NT.

Kohl, Georg: *See*—
Erpenbach, Heinz; Gehrmann, Klaus; Horstermann, Peter; Kubbeler, Hans-Klaus; and Kohl, Georg, 4,549,937, Cl. 203-40.000.

Kohler, Rolf-Dieter: *See*—
Disteldorf, Walter; Eisfeld, Wolfgang; and Kohler, Rolf-Dieter, 4,550,208, Cl. 564-329.000.

Kohn, Rachel S., to Celanese Corporation. Thixotropic aqueous solutions containing a crosslinked polygalactomannan gum. 4,549,907, Cl. 106-208.000.

Kohsiek, Cord H., to U.S. Philips Corporation. Voltage-current converter having reference resistor spread compensation. 4,550,262, Cl. 307-260.000.

Koizumi, Naoko: *See*—
Hirosawa, Toshio; Ohki, Masaru; Miyazaki, Katuto; Kobayashi, Nobuo; and Koizumi, Naoko, 4,550,386, Cl. 364-900.000.

Kojima, Hiroshige: *See*—
Hasegawa, Akio; and Kojima, Hiroshige, 4,550,080, Cl. 435-212.000.

Kojima, Kenji, to Mitsubishi Denki Kabushiki Kaisha. Detecting circuit. 4,550,338, Cl. 358-20.000.

Kokado, Akira: *See*—
Fujii, Toshinobu; and Kokado, Akira, 4,550,065, Cl. 429-105.000.

Kolesar, Edward S., Jr., to United States of America, Air Force. Electronic nerve agent detector. 4,549,427, Cl. 73-23.000.

Komiyama, Kanki: *See*—
Umezawa, Iwao; and Komiyama, Kanki, 4,550,021, Cl. 424-122.000.

Komuro, Katsusuke, to Honda Giken Kogyo Kabushiki Kaisha. Rear seat device for two-wheeled motor vehicles. 4,549,629, Cl. 180-219.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Yamauchi, Yasuhisa; Asano, Masao; and Arai, Mitsutaka, 4,550,054, Cl. 428-328.000.

Konno, Kazutoshi: *See*—
Wakabayashi, Manabu; Minami, Kihachiro; Sanpei, Tohru; and Konno, Kazutoshi, 4,550,354, Cl. 360-133.000.

Kono, Katsuaki, to Kabushiki Kaisha Ishida Koki Seisakusho. Combinatorial weighing method and apparatus. 4,549,618, Cl. 177-25.000.

Kontoghiorghes, George: *See*—
Hider, Robert C.; Kontoghiorghes, George; Silver, Jack; and Stockham, Michael A., 4,550,101, Cl. 514-188.000.

Korb, Louis L.; and Waitkus, Phillip A., to Plastics Engineering Company. Vitreous carbon and process for preparation thereof. 4,550,015, Cl. 423-445.000.

Kordomenos, Panagiotis I., to Ford Motor Company. Thermosetting coating composition. 4,550,154, Cl. 528-73.000.

Korppoo, Seppo; and Hanel, Henry, to Oy Wartsila Ab. Arrangement in air cushion vehicles. 4,549,626, Cl. 180-127.000.

Kosaka, Takao; and Tsukahara, Hirokazu, to Mitsubishi Paper Mills, Limited. Image-receiving color-forming sheet for transfer electrophotography. 4,550,328, Cl. 346-201.000.

Kosal, Jeffrey A.: *See*—
Chandra, Grish; Kosal, Jeffrey A.; Petroff, Lenin J.; and Pluedemann, Edwin P., 4,549,979, Cl. 252-135.000.

Kosuge, Yasutaka: *See*—
Nunogaki, Yoshiaki; Kobayashi, Tetsuya; and Kosuge, Yasutaka, 4,550,417, Cl. 377-10.000.

Kot, Vincent; Wallis, Bruce; and Robinson, Alfred, to Efcor, Inc. Armored cable connector. 4,549,755, Cl. 285-341.000.

Koumura, Takashi, to Honda Giken Kogyo Kabushiki Kaisha. Method of controlling operating amounts of operation control means for an internal combustion engine. 4,549,516, Cl. 123-478.000.

Koumura, Takashi, to Honda Giken Kogyo Kabushiki Kaisha. Method of controlling operating amounts of operation control means for an internal combustion engine. 4,549,518, Cl. 123-478.000.

Kovach, Stephen M.: *See*—
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Hettinger, William P., Jr.; Kovach, Stephen M.; Palmer, James L.; and Zandona, Oliver J., 4,549,958, Cl. 208-253.000.

Kovtun, Jury P.: *See*—
Gjulling, Eduard V.; Djugovskaya, Larisa A.; Zabolotny, Dmitry I.; Kovtun, Jury P.; Liptuga, Nikolai I.; Litus, Viktor I.; Sambur, Marina B.; Romanov, Nikolai N.; Tolmachev, Alexei I.; Kirsanov, Alexandr V.; Pisanko, Viktor N.; Melnikov, Oleg F.; and Klochkov, Evgeny I., 4,550,170, Cl. 548-154.000.

Koyo Jidoki Co., Ltd.: *See*—
Yamashita, Kyouichi, 4,549,454, Cl. 83-27.000.

Kozar, John J. Lazy susan vise. 4,549,727, Cl. 269-70.000.

Kozima, Noboru: *See*—
Terada, Toshimichi; Kuroyanagi, Tomomitsu; Kozima, Noboru; and Shibata, Akira, 4,550,345, Cl. 358-323.000.

Kozinski, Thomas G.: *See*—
Kenworthy, James S.; and Kozinski, Thomas G., 4,549,939, Cl. 204-4.000.

Kozlowski, Ronald J.: *See*—
Samuel, Raj K.; Kozlowski, Ronald J.; and Pustek, Frank J., 4,549,909, Cl. 127-33.000.

Kraatz, Udo: *See*—
Kramer, Wolfgang; Buchel, Karl H.; Elbe, Hans-Ludwig; Kraatz, Udo; Regel, Erik; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Lurssen, Klaus, 4,549,900, Cl. 71-92.000.

Kramer, Wolfgang; Buchel, Karl H.; Elbe, Hans-Ludwig; Kraatz, Udo; Regel, Erik; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Lurssen, Klaus, to Bayer Aktiengesellschaft. Combating fungi with substituted 1-azolyl-butan-2-ones and -2-ols. 4,549,900, Cl. 71-92.000.

Kranauer, Erwin: *See*—
Ebner, Anneliese; and Kranauer, Erwin, 4,549,406, Cl. 62-241.000.

Krauss, Robert; and Binder, Klaus, to Peroxid-Chemie GmbH. Lid with vent valve. 4,549,668, Cl. 220-203.000.

Krenn, Karl-Dieter: *See*—
Fischer, Wolfgang; Seitz, Georg; and Krenn, Karl-Dieter, 4,550,083, Cl. 436-42.000.

Kropiwnicki, Tadek M.; and Braymer, Joseph E., to Carrier Corporation. Hermetic motor compressor having a suction inlet and seal. 4,549,857, Cl. 417-312.000.

Krude, Werner, to Uni-Cardan Aktiengesellschaft. Angularly movable universal joint. 4,549,873, Cl. 464-141.000.

Kruger, Roland; and Ehrlinger, Klaus, to Holstein & Kappert GmbH. Method of boiling wort. 4,550,029, Cl. 426-487.000.

Kubbeler, Hans-Klaus: *See*—
Erpenbach, Heinz; Gehrmann, Klaus; Horstermann, Peter; Kubbeler, Hans-Klaus; and Kohl, Georg, 4,549,937, Cl. 203-40.000.

Kucharska, Helena Z.; and Burton, Thomas M., to Fiberglas Canada Inc. Blowing agents and their use in preparations of polyester foams. 4,550,124, Cl. 521-85.000.

Kuehl, Ulrich: *See*—
Schoen, Uwe; Hachmeister, Bernd; Kehrbach, Wolfgang; Kuehl, Ulrich; and Buschmann, Gerd, 4,550,112, Cl. 514-278.000.

Kugler, Kurt; Lessmann-Mieske, Hans-Henning; and Wein, Franz, to Maschinenfabrik Reinhausen Gebruder Scheubeck GmbH & Co. KG. Load-switching circuit for antiparallel thyristor networks and a tapped transformer. 4,550,285, Cl. 323-343.000.

Kugler, Uwe H., to Deere & Company. Female coupler for a fluid circuit. 4,549,577, Cl. 137-614.040.

Kuhla, Donald E.: *See*— .
Goldman, Irving M.; Kuhla, Donald E.; and Sklavounos, Constantine, 4,550,164, Cl. 544-291.000.

Kuhlmann, Robert E.: *See*—
Gowan, Norman H.; Petravicius, Stasys; Hernandez, Ignacio T.; Kuhlmann, Robert E.; Vande Walle, Donald R., Jr.; Weddell, Ronald P.; Gates, Joseph M.; Sitzwohl, Kenneth J.; Sands, Charles D.; Gwinn, Rick A.; and Peterman, Milton J., 4,549,664, Cl. 211-131.000.

Kumahara, Katsumi: *See*—
Chiba, Hiromasa; Kumahara, Katsumi; Harada, Takakiyo; Oka, Takahiro; and Sato, Akihiro, 4,550,144, Cl. 525-247.000.

Kumar, Devendra; Fohlen, George M.; and Parker, John A., to United States of America, National Aeronautics and Space Administration. Maleimido substituted aromatic cyclotriphosphazenes. 4,550,177, Cl. 548-413.000.

Kumazawa, Satoru: *See*—
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizu, Susumu; Watanabe, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,549,902, Cl. 71-90.000.

Kummer, Rudolf: *See*—
Platz, Rolf; Kummer, Rudolf; Schneider, Heinz-Walter; and Schwirten, Kurt, 4,550,195, Cl. 560-206.000.

Kumpar, Zvonimir Z., to SKF Industrial Trading & Development Company B.V. Homokinetic coupling. 4,549,872, Cl. 464-141.000.

Kung, Walter; and Svarc, Stefan, to Maschinenfabrik Sulzer-Ruti AG. Apparatus for removing severed fabric parts from a weaving machine. 4,549,582, Cl. 139-430.000.

Kuo, James C.: *See*—
Garwood, William E.; Kuo, James C.; Jacob, Solomon M.; and Wise, John J., 4,549,396, Cl. 60-39.020.

Kupersmit, Julius B. Collapsible container for liquids. 4,549,673, Cl. 220-465.000.

Kurahashi, Keizo: *See*—
Yamaguchi, Hisashi; Asano, Toru; Takahara, Kazuhiro; Kurahashi, Keizo; and Andoh, Shizuo, 4,550,310, Cl. 340-365.00C.

Kurdy, George A.: *See*—
Graf, Harlan G.; Janssen, Harry R.; and Kurdy, George A., 4,549,934, Cl. 196-98.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizu, Susumu; Watanabe, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,549,902, Cl. 71-90.000.

Kuroyanagi, Tomomitsu: *See*—
Terada, Toshimichi; Kuroyanagi, Tomomitsu; Kozima, Noboru; and Shibata, Akira, 4,550,345, Cl. 358-323.000.

Kurt, Lynn E., to Deere & Company. Method of checking for hydraulic leakage. 4,549,429, Cl. 73-40.000.

Kurtti, Gary R., to General Motors Corporation. Belt clamping guide loop. 4,549,770, Cl. 297-479.000.

Kuwatsuka, Shunichiro: *See*—
Hirai, Osamu; Kobayashi, Tetsuo; Kuwatsuka, Shunichiro; and Suzuki, Saburo, 4,550,353, Cl. 360-125.000.

Kysela, Ernst: *See*—
Hagemann, Hermann; Klauke, Erich; and Kysela, Ernst, 4,549,994, Cl. 260-544.00F.

Kyushu Hitachi Maxell, Ltd.: *See—*
Ochiai, Masahiko; and Taito, Yoshinori, 4,549,352, Cl. 30-41.500.
La Calhene Societe Anonyme: *See—*
Glachet, Charles; Francois, Daniel; Tentelier, Jean; and Frioux, Christian, 4,549,839, Cl. 414-7.000.
Lacroix, Marc: *See—*
Le Tiec, Patrick; and Lacroix, Marc, 4,549,646, Cl. 198-409.000.
Laesecke, Klaus P.: *See—*
Folkers, Karl; and Laesecke, Klaus P., 4,550,109, Cl. 514-249.000.
Laghi, Aldo A., to General Electric Company. Method of making a molded part utilizing a liquid injection molding apparatus. 4,550,006, Cl. 264-328.200.
Lai, Ching C.: *See—*
Schoenig, Frederick C., Jr.; Landry, J. David; Walker, Edward S.; and Lai, Ching C., 4,549,662, Cl. 209-539.000.
L'Air Liquide, Societe Anonyme Pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
Monnier, Jean-Pierre, 4,549,563, Cl. 137-100.000.
Lajoye, Pierre. Apparatus and method for manufacture of curved hollow toroidal elements. 4,549,339, Cl. 29-527.600.
Lamb, Richard H., Jr.: *See—*
Guinon, Walter J.; and Lamb, Richard H., Jr., 4,550,414, Cl. 375-1.000.
Lamitref Aluminium: *See—*
Cloostermans-Huwaert, Leon R. L. G., 4,549,420, Cl. 72-41.000.
Lancaster, William G., to Lantech, Inc. Package sealing apparatus. 4,549,388, Cl. 53-556.000.
Landis, Phillip S.: *See—*
Horodysky, Andrew G.; and Landis, Phillip S., 4,549,976, Cl. 252-49.800.
Landry, J. David: *See—*
Schoenig, Frederick C., Jr.; Landry, J. David; Walker, Edward S.; and Lai, Ching C., 4,549,662, Cl. 209-539.000.
Lane, Robert C.: *See—*
Lee, Joseph M.; and Lane, Robert C., 4,549,408, Cl. 62-320.000.
Lange, Wolfgang: *See—*
Gerlach, Klaus; Lange, Wolfgang; and Loh, Dieter, 4,549,969, Cl. 210-759.000.
Langen, Jacobus J. Smoke house cooking. 4,549,476, Cl. 99-352.000.
Langner, Alexander, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Bucket-wheel loader for bulk material piles. 4,549,648, Cl. 198-509.000.
Lantech, Inc.: *See—*
Lancaster, William G., 4,549,388, Cl. 53-556.000.
Larribe, Andre P., to Societe Nationale Industrielle et Aerospatiale. Apparatus for draping layers of composite materials. 4,549,864, Cl. 425-145.000.
Larson, Bert R.; and Wartenbergh, Robert P., to Dysan Corporation. Removable disk cartridge with improved hub locking mechanism. 4,550,355, Cl. 360-133.000.
Larson, Rodney L.: *See—*
Winter, Arthur J.; and Larson, Rodney L., 4,550,247, Cl. 235-472.000.
Larson, Warren M.: *See—*
Brooks, Jeffrey B.; and Larson, Warren M., 4,550,068, Cl. 430-122.000.
Lassander, Erik; and Stenkvist, Sven E., to ASEA Aktiebolag. Symmetrical current conductor system for a DC arc furnace. 4,550,413, Cl. 373-108.000.
Lau, Yue-Ying; and Barnett, Larry R., to United States of America, Navy. Gyromagnetron amplifier. 4,550,271, Cl. 315-4.000.
Laughman, Lanny M.: *See—*
Chenausky, Peter P.; Hoffman, Nelson N.; and Laughman, Lanny M., 4,550,410, Cl. 372-97.000.
Laurent, Henry: *See—*
Hofmeister, Helmut; Schulze, Paul E.; Annen, Klaus; Laurent, Henry; and Wiechert, Rudolf, 4,550,100, Cl. 514-179.000.
Lauritzen, Nels J., to Johnson & Johnson Products, Inc. Adhesive bandage and package. 4,549,653, Cl. 206-441.000.
Lautenschlager, Karl, Jr., to Karl Lautenschlager KG Mobelbeschlagfabrik. Set of joining hardware. 4,549,831, Cl. 403-231.000.
Lavallee, Francois A., to Essex Group, Inc. Titanium chelate modified nylon magnet wire insulation coating. 4,550,055, Cl. 428-383.000.
Lavaur, Jacques: *See—*
Auge, Jean; Lavaur, Jacques; and Assens, Michel, 4,549,358, Cl. 33-560.000.
Lavretskaya, Elionora F.; Rudzit, Ernest A.; Piruzian, Lev A.; Volkova, Ljubov I.; Zakharova, Nina I.; Sarkisian, David A.; Upadysheva, Alexandra V.; Grigorieva, Natalya D.; Znamenskaya, Anna P.; Libinzon, Rakhil E.; and Antonian, Semen G., to Nauchno-Issledovatelsky Institut Po Biologicheskikm Ispytaniyam Khimicheskikh Soedineny. 9-Amino-2,3,5,6,7,8-hexahydro-1H-cyclopenta(b-)quinoline monohydrate hydrochloride as stimulant of neuro-muscular transmission of smooth muscles. 4,550,113, Cl. 514-290.000.
Law, Simon M. L.: *See—*
Zomorrodi, Mehrdad; Cheung, Li-Fung; and Law, Simon M. L., 4,550,254, Cl. 250-338.000.
Lawrence, Christopher J.: *See—*
Brough, Denys W.; and Lawrence, Christopher J., 4,549,361, Cl. 34-17.000.
Layton, James E., to Phillips Petroleum Company. Waveform generator. 4,550,263, Cl. 307-261.000.
Le Materiel de Voirie: *See—*
Pineau, Jean, 4,549,326, Cl. 15-84.000.
Leach, Robert L.; and Wickens, Richard L., to Servo-Tek Products Company. Unipolar rotational speed transducer. 4,550,283, Cl. 322-48.000.
Leconte, Michel: *See—*
Basset, Jean M. M.; Leconte, Michel; Ollivier, Jean; and Quignard, Francoise, 4,550,216, Cl. 585-645.000.
Lee, Chi-Long; Maxson, Myron T.; and Rabe, James A., to Dow Corning Corporation. Foamable polyorganosiloxane compositions. 4,550,125, Cl. 521-117.000.
Lee, David N.; and Tanner, William M., to General Motors Corporation. Vehicle body sealing arrangement. 4,549,761, Cl. 296-206.000.
Lee, Joseph M.; and Lane, Robert C. Cube icemaker with rotary ice remover means. 4,549,408, Cl. 62-320.000.
Lee, Lester T. C.: *See—*
Patel, Gordhanbhai N.; Preziosi, Anthony F.; Bhattacharjee, Himangshu R.; and Lee, Lester T. C., 4,550,150, Cl. 526-233.000.
Lee, Mark C.: *See—*
Barmatz, Martin B.; Granett, Dan; and Lee, Mark C., 4,549,435, Cl. 73-505.000.
Leger, Andre : *See—*
Farge, Daniel; Leger, Andre ; and Ponsinet, Gerard, 4,550,110, Cl. 514-254.000.
Leger, Raymond A., to Cherry Electrical Products Corporation. Electrical appliance interlock switch with improved isolation means. 4,550,233, Cl. 200-61.620.
Legg, Ernest L.: *See—*
Federico, Anthony M.; Legg, Ernest L.; Wiiczek, Stephen P.; Prasad, Hari K.; and Petery, James J., 4,550,382, Cl. 364-572.000.
le Grande, Josephus N., to Dowe Egberts Koninklijke Tabaksfabriek-Koffiebranderijen-Theehandel N.V. Apparatus for preparing hot drinks. 4,550,024, Cl. 426-77.000.
Lehky, Josef: *See—*
Husak, Zdenek; Svozil, Zdenek; Mazak, Ivan; Lehky, Josef; Hora, Josef; Smid, Zdenek; and Kebrle, Ondrej, 4,549,742, Cl. 280-11.180.
Lehmacher, Hans. Apparatus for making bags of thin synthetic-resin film. 4,549,877, Cl. 493-204.000.
Lehmann, Robert P.; and Vianco, James E., to Eastman Kodak Company. Retaining rings for optical disk assemblies. 4,550,396, Cl. 369-284.000.
Leiman, Leslie L., to Superior Scale Co. Ltd. Heavy duty weigh scale. 4,549,622, Cl. 177-134.000.
Leland Stanford Jr. University, The Board of Trustees of The: *See—*
Stocker, Bruce A. D., 4,550,081, Cl. 435-253.000.
LeMahieu, Ronald A., to Hoffmann-La Roche Inc. Naphthalenyloxy carboxylic acids. 4,550,190, Cl. 560-053.000.
Lemmer, Helmut, to Starkstrom Gummersbach GmbH. Circuit breaker. 4,550,232, Cl. 200-16.00A.
Lenders, Wilhelmus L. L.: *See—*
Gorris, Joannes J. H. M.; and Lenders, Wilhelmus L. L., 4,549,335, Cl. 29-866.000.
Lepisto, J. George, to Champion International Corporation. Multiwall gussetted bag with seamless tubular liner. 4,550,442, Cl. 383-113.000.
Lerohl, John A.: *See—*
Tobin, Patrick L.; Green, Joseph W.; and Lerohl, John A., 4,549,739, Cl. 273-248.000.
Lessmann-Mieske, Hans-Henning: *See—*
Kugler, Kurt; Lessmann-Mieske, Hans-Henning; and Wein, Franz, 4,550,285, Cl. 323-343.000.
Le Tiec, Patrick; and Lacroix, Marc, to Regie Nationale des Usines Renault. Device for separation, orientation, and positioning of parts generally flat in shape. 4,549,646, Cl. 198-409.000.
Leuven Research & Development: *See—*
Dewaegheneire, Gabriel, 4,549,717, Cl. 251-111.000.
Lever Brothers Company: *See—*
Evans, Elfed H.; Hirte, Klaus; and Stremmel, Gerd, 4,549,978, Cl. 252-109.000.
Levert, Henri: *See—*
Gervais, Edouard; and Levert, Henri, 4,549,598, Cl. 164-66.100.
Levy, Alan J., to Ethicon Inc. Segmented polyurethane surgical buttressing pledgets. 4,549,545, Cl. 128-335.000.
Levy, Leon S.: *See—*
Freeman, Martin; and Levy, Leon S., 4,550,436, Cl. 382-34.000.
Leyck, Sigurd: *See—*
Welter, Andre ; Leyck, Sigurd; and Etschenberg, Eugen, 4,550,168, Cl. 546-270.000.
Liang, Dah-Ben; and Gulibon, Robert S., to Kennametal Inc. Single-pass notching and drilling tool and method of drilling a blast role therewith. 4,549,615, Cl. 175-389.000.
Libinzon, Rakhil E.: *See—*
Lavretskaya, Elionora F.; Rudzit, Ernest A.; Piruzian, Lev A.; Volkova, Ljubov I.; Zakharova, Nina I.; Sarkisian, David A.; Upadysheva, Alexandra V.; Grigorieva, Natalya D.; Znamenskaya, Anna P.; Libinzon, Rakhil E.; and Antonian, Semen G., 4,550,113, Cl. 514-290.000.
Licentia Patent-Verwaltungs-GmbH: *See—*
Marten, Peter; and Petermann, Klaus, 4,549,806, Cl. 356-350.000.
Lin, Yang-I: *See—*
Hlavka, Joseph J.; Bitha, Panayota; and Lin, Yang-I, 4,550,169, Cl. 548-108.000.
Lindemann, Martin K. O.; and Lukenbach, Elvin R., to Johnson & Johnson Baby Products Company. Process for the preparation of 2,3-dimercaptosuccinic acid and its lower alkyl esters. 4,550,193, Cl. 560-147.000.
Lindstrom, Merlin R., to Phillips Petroleum Company. UV Cured polyurethanes using organotin promoters. 4,549,945, Cl. 204-159.110.

Lion Corporation: *See*—
Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Junichi; and Ukigai, Toshiyuki, 4,549,607, Cl. 166-274.000.
Satsuki, Teruhisa; and Ota, Seiiti, 4,549,984, Cl. 252-532.000.
Liou, Mou T. Combination of screw spanner and nut breaker. 4,549,324, Cl. 7-142.000.
Liptuga, Nikolai I.: *See*—
Gjulling, Eduard V.; Djugovskaya, Larisa A.; Zabolotny, Dmitry I.; Kovtun, Jury P.; Liptuga, Nikolai I.; Litus, Viktor I.; Sambur, Marina B.; Romanov, Nikolai N.; Tolmachev, Alexei I.; Kirsanov, Alexandr V.; Pisanko, Viktor N.; Melnikov, Oleg F.; and Klochkov, Evgeny I., 4,550,170, Cl. 548-154.000.
Litton Systems, Inc.: *See*—
Cox, David L.; Ross, William E.; and Toche, Calvin A., 4,550,389, Cl. 365-37.000.
Litus, Viktor I.: *See*—
Gjulling, Eduard V.; Djugovskaya, Larisa A.; Zabolotny, Dmitry I.; Kovtun, Jury P.; Liptuga, Nikolai I.; Litus, Viktor I.; Sambur, Marina B.; Romanov, Nikolai N.; Tolmachev, Alexei I.; Kirsanov, Alexandr V.; Pisanko, Viktor N.; Melnikov, Oleg F.; and Klochkov, Evgeny I., 4,550,170, Cl. 548-154.000.
Liu, Yen-Ping; Ullman, Edwin F.; and Becker, Martin J., to Syntex (U.S.A.) Inc. Fluorescence screening for blood typing. 4,550,017, Cl. 424-11.000.
Ljung, Erik A.: *See*—
Hartwig, Carl S. M.; Ljung, Erik A.; and Obel, Erik M., 4,550,282, Cl. 318-808.000.
Loctite Corporation: *See*—
Thompson, Richard T.; Hinkle, Philip; and Carroll, Robert B., 4,550,041, Cl. 428-35.000.
Loh, Dieter: *See*—
Gerlach, Klaus; Lange, Wolfgang; and Loh, Dieter, 4,549,969, Cl. 210-759.000.
Lohse, Friedrich: *See*—
Stockinger, Friedrich; Lohse, Friedrich; and Zondler, Helmut, 4,550,203, Cl. 564-105.000.
Loizeau, Pierre, to Valeo. Torsion dampers. 4,549,642, Cl. 192-106.200.
Lolly, Richard W. Jet propulsion system for boats. 4,549,868, Cl. 440-42.000.
Lopatin, George; Coplan, Myron J.; and Walton, James P., Jr., to Albany International Corp. Thermally plastifiable compositions for microporous sorbent structure. 4,550,123, Cl. 521-64.000.
Lord, Richard G.; and Nieva, Kenneth J., to Carrier Corporation. Method and control system for protecting an evaporator in a refrigeration system against freezeups. 4,549,403, Cl. 62-201.000.
Lord, Richard G., to Carrier Corporation. Dual pump down cycle for protecting a compressor in a refrigeration system. 4,549,404, Cl. 62-224.000.
L'Oreal: *See*—
Gueret, Jean-Louis H.; and Beck, Jean-Paul C., 4,549,559, Cl. 132-11.00R.
Lorenz, Donald H., to Hydromer, Inc. Hydrophilic, flexible, open cell polyurethane-poly(N-vinyl lactam) interpolymer foam and dental and biomedical products fabricated therefrom. 4,550,126, Cl. 521-159.000.
Loshaek, Samuel; and Townsley, Malcolm G., to Schering Corporation. Hydrophilic bifocal contact lens. 4,549,794, Cl. 351-161.000.
Lotfy, Mohammed H. Racquet for playing a ball game. 4,549,736, Cl. 273-67.00R.
Louiday, Andre E., to U.S. Philips Corporation. Radiology table for exposures with variable tilting angle and source-patient distance and for tomography. 4,550,421, Cl. 378-196.000.
Louis Hand, Inc.: *See*—
Bouthillier, Robert, 4,549,495, Cl. 112-315.000.
Lowin, Anne-Marie; and Wight, Eleanor G., to International Business Machines Corporation. Programming aid device. 4,549,500, Cl. 116-240.000.
Lowry, Louis D.: *See*—
Katz, Philip; Brenman, Henry S.; Lowry, Louis D.; and Schwartz, Harold, 4,550,427, Cl. 381-70.000.
Lucas Industries, p.l.c.: *See*—
Gaskell, David J., 4,549,696, Cl. 239-452.000.
Lucas Industries public limited company: *See*—
Price, Anthony G.; and Edwards, Roy E., 4,549,636, Cl. 188-71.400.
Lucas, Robert G., to Beloit Corporation. Web tension load cell. 4,549,701, Cl. 242-75.300.
Lucitron, Inc.: *See*—
Glaser, David; and Whelchel, Charles J., 4,550,039, Cl. 428-13.000.
Ludwig, Frank A.; and Helber, Carlyle L., Jr., to Hughes Aircraft Company. Electroless silver plating process and system. 4,550,036, Cl. 427-443.100.
Lukas, Michael P.: *See*—
Keyes, Marion A., IV; Lukas, Michael P.; and Moss, William H., 4,549,503, Cl. 122-479.00R.
Lukenbach, Elvin R.: *See*—
Lindemann, Martin K. O.; and Lukenbach, Elvin R., 4,550,193, Cl. 560-147.000.
Lunde, Martin R., to Garn, Incorporated. Combination wood-fired boiler and storage apparatus. 4,549,526, Cl. 126-367.000.
Lurssen, Klaus: *See*—
Forster, Heinz; Klauke, Erich; Eue, Ludwig; Schmidt, Robert R.; and Lurssen, Klaus, 4,549,899, Cl. 71-90.000.
Kramer, Wolfgang; Buchel, Karl H.; Elbe, Hans-Ludwig; Kraatz, Udo; Regel, Erik; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Lurssen, Klaus, 4,549,900, Cl. 71-92.000.
Lussling, Theodor: *See*—
Karrenbauer, Michael; Kleemann, Axel; Lussling, Theodor; and Schafer, Fritz, 4,550,199, Cl. 562-556.000.
Karrenbauer, Michael; Kleemann, Axel; Lussling, Theodor; and Schafer, Fritz, 4,550,200, Cl. 562-556.000.
Lynch, Daniel; and Perry, Steven B., to Keptel, Inc. AC Signal-activated switching apparatus. 4,550,225, Cl. 179-81.00R.
Lynch, John; and Elzer, Albert, to BASF Aktiengesellschaft. Photosensitive recording materials containing particles for the production of abrasion-resistant gravure printing plates, and the production of gravure printing plates using these recording materials. 4,550,072, Cl. 430-256.000.
M.A.N. Roland-Druckmaschinen Aktiengesellschaft: *See*—
Nawrath, Nikolaus, 4,549,485, Cl. 101-219.000.
Mabry, Melinda A.; Prichard, William W.; and Ziemecki, Stanislaw B., to Du Pont de Nemours, E. I., and Company. Process for making tetrahydrofuran and 1,4-butanediol using Pd/Re hydrogenation catalyst. 4,550,185, Cl. 549-508.000.
Mabusth, Scott. Touch sensitive control device. 4,550,221, Cl. 178-18.000.
Maciejczak, Robert A. Inspection system for mechanical structures. 4,550,376, Cl. 364-512.000.
Mack, Wolfgang. Writing implement with two retractable cartridges. 4,549,827, Cl. 401-29.000.
MacLean-Fogg Company: *See*—
Trendler, David, 4,549,670, Cl. 220-338.000.
Maeda, Keisuke, to Minolta Camera Kabushiki Kaisha. Compact automatic focusing lens shutter type camera. 4,549,800, Cl. 354-400.000.
Maeda, Naoyuki: *See*—
Abe, Michio; Maeda, Naoyuki; and Tokunaga, Shigemitsu, 4,549,628, Cl. 180-143.000.
Maeda, Takeshi; Takasago, Masahiro; and Tsunoda, Yoshito, to Hitachi, Ltd. System for optically recording information. 4,550,394, Cl. 369-46.000.
Magadini, Charles R. Vertically adjustable hangers for pictures, and the like. 4,549,713, Cl. 248-495.000.
Magda, Doina: *See*—
Tremmel, Robert A.; and Magda, Doina, 4,549,942, Cl. 204-40.000.
Maier, Thomas: *See*—
Koch, Manfred; and Maier, Thomas, 4,550,174, Cl. 548-306.000.
Maisch, Wolfgang, to Robert Bosch GmbH. Fuel injection system. 4,549,515, Cl. 123-452.000.
Makedonski, Boris G.; and Atanassov, Haralampi A., to Centralen Mashinostroitelen Institute. Machine for finishing complex profiled workpieces. 4,549,370, Cl. 51-7.000.
Makhlouf, Joseph M.; McCollum, Gregory J.; and Kerr, Paul R., to PPG Industries, Inc. Coated article. 4,550,060, Cl. 428-423.100.
Makino Milling Machine Co., Ltd.: *See*—
Sato, Makoto; and Hiramoto, Kazuyuki, 4,550,375, Cl. 364-474.000.
Makley, James A., to Monarch Marking Systems, Inc. Printing apparatus. 4,549,483, Cl. 101-45.000.
Makris, James S.: *See*—
Goth, George R.; Hansen, Thomas A.; and Makris, James S., 4,549,927, Cl. 156-643.000.
Malek, Wasfi N., to Beiersdorf Aktiengesellschaft. Gravel-resistant selfadhesive decorative film. 4,550,052, Cl. 428-323.000.
Mandel, Eric: *See*—
Basi, Jagtar S.; and Mandel, Eric, 4,549,374, Cl. 51-283.00R.
Manitowoc Company, Inc., The: *See*—
West, John D.; Trainor, James E.; and Karman, James D., 4,550,244, Cl. 219-158.000.
Manon, Kenneth P., to Swenson Spreader Company. Spreader guard. 4,549,697, Cl. 239-681.000.
Manville Service Corporation: *See*—
Byrd, Carlisle O., Jr., 4,549,382, Cl. 52-506.000.
Maresca, Louis M.: *See*—
Rimsa, Stephen B.; Harris, James E.; Chao, Herbert S.; and Maresca, Louis M., 4,550,140, Cl. 525-132.000.
Marhoff, Paul: *See*—
Aichinger, Horst; Marhoff, Paul; and Pfeiler, Manfred, 4,550,419, Cl. 378-099.000.
Marino, Emilio; and Ramacciotti, Aldo, to Centro Sperimentale Metallurgico S.p.A. Casting of aluminium-killed steels. 4,549,677, Cl. 222-591.000.
Markem Corporation: *See*—
Brooks, Jeffrey B.; and Larson, Warren M., 4,550,068, Cl. 430-122.000.
Markham, Charles W. Aspiration biopsy device. 4,549,554, Cl. 128-753.000.
Markman, Herbert. Inventory control and reporting system for dry-cleaning stores. 4,550,246, Cl. 235-385.000.
Marlow, Richard A.: *See*—
Becker, William A.; Marlow, Richard A.; and Schlags, William I., 4,550,038, Cl. 428-12.000.
Marsh, Lawrence B., to Marsh-McBirney, Inc. Pressure level sensor. 4,549,434, Cl. 73-299.000.
Marsh-McBirney, Inc.: *See*—
Marsh, Lawrence B., 4,549,434, Cl. 73-299.000.
Marshall, J. John: *See*—
Woodbridge, J. Eliot; Bulbenko, George F.; and Marshall, J. John, 4,550,077, Cl. 435-22.000.
Marshall, Stephen; and An, Hung D., to ACI Australia Limited. Flexible container filling apparatus. 4,549,387, Cl. 53-469.000.
Marten, Peter; and Petermann, Klaus, to Licentia Patent-Verwaltungs-GmbH. Method and apparatus measuring absolute rotation. 4,549,806, Cl. 356-350.000.

Martin, Andrew McG. Easily opened and reclosable bag and apparatus for making same. 4,549,657, Cl. 206-610.000.

Martin, Gerard J.; and Martin, Maryvonne L., to Centre National de la Recherche Scientifique. Process for the detection and the qualitative and quantitative differentiation of naturally deuterated molecules and application thereof more especially to the detection of chaptalization of wines. 4,550,082, Cl. 436-24.000.

Martin, John: *See—*
Tarjan, Peter P.; Miller, Sandra L.; and Martin, John, 4,549,556, Cl. 128-785.000.

Martin, Maryvonne L.: *See—*
Martin, Gerard J.; and Martin, Maryvonne L., 4,550,082, Cl. 436-24.000.

Martin, Pierre, to Ciba Geigy Corporation. Process for producing 1,2,5,6-tetrahydro-4H-pyrrolo-[3,2,1-ij]-quinolin-4-one. 4,550,165, Cl. 546-94.000.

Martin, William J.; Carr, Keith E.; and Peterson, Edward C., to Whirlpool Corporation. Convertible vacuum and powder carpet cleaner. 4,549,328, Cl. 15-338.000.

Maruho Co., Ltd.: *See—*
Chikazawa, Nobumoto; Muraoka, Toshiharu; and Fujii, Setsuro, 4,550,076, Cl. 435-18.000.

Maruyamano, Satoru: *See—*
Ootani, Hisao; and Maruyamano, Satoru, 4,549,641, Cl. 192-106.200.

Maschinenfabrik Reinhausen Gebruder Scheubeck GmbH & Co. KG: *See—*
Kugler, Kurt; Lessmann-Mieske, Hans-Henning; and Wein, Franz, 4,550,285, Cl. 323-343.000.

Maschinenfabrik Sulzer-Ruti AG: *See—*
Kung, Walter; and Svarc, Stefan, 4,549,582, Cl. 139-430.000.

Mask, Ernest D.: *See—*
Hibler, Donald R., Jr.; and Mask, Ernest D., 4,549,734, Cl. 272-134.000.

Masters, David R.: *See—*
Holcombe, Cressie E.; Masters, David R.; and Pfeiler, William A., 4,550,412, Cl. 373-155.000.

Masui, Saburo, to Yasui Sangyo Co., Ltd. Screw body jack and a body jack assembly. 4,549,423, Cl. 72-295.000.

Masunaga, Mikio: *See—*
Yahagi, Mitsuhisa; Masunaga, Mikio; Watanabe, Shuichi; and Tanaka, Tsutomu, 4,549,593, Cl. 152-330.00R.

Matas Gabalda, Carlos, to Asa S.A. Machine for cabling yarns and in particular glass yarns. 4,549,393, Cl. 57-58.360.

Mathiesen, Mait M.; Gillberg, Lars I.; Hellsten, Karl M. E.; and Karlsson, Gunvor B. T., to Ab Carbogel; and Berol Kemi Ab. Aqueous slurry of a solid fuel and a process and means for the production thereof. 4,549,881, Cl. 44-51.000.

Matko, William F.: *See—*
Newell, S. David; Matko, William F.; Onoratti, James L.; and Parrott, Lawrence H., 4,549,337, Cl. 29-527.400.

Matsuda, Shinpei: *See—*
Horiba, Tatsuo; Fujita, Kazunori; Matsuda, Shinpei; and Tamura, Kohki, 4,550,067, Cl. 429-213.000.

Matsumiya, Saburo; Uehara, Katsuya; Saito, Keiji; Michiki, Hideyuki; and Yaginuma, Kenichi, to Toyo Engineering Corporation. Process for the preparation of pellets. 4,549,904, Cl. 75-7.000.

Matsumoto, Hirofumi, to Nippon Mektron, Ltd. Interconnected printed circuit boards and method of connecting circuit boards. 4,550,357, Cl. 361-398.000.

Matsumoto, Seishi; Nakashimizu, Takeo; and Abe, Yuji, to Kabushiki Kaisha Ishida Koki Seisakusho. Combinatorial weighing and combinatorial counting method and apparatus. 4,549,617, Cl. 177-1.000.

Matsunaga, Kuniyoshi: *See—*
Yamada, Hideaki; Otsuji, Shogo; Isobe, Kimiyasu; Matsunaga, Kuniyoshi; and Inukai, Tadahiko, 4,550,078, Cl. 435-25.000.

Matsuo, Taisuke; Kishimoto, Shoji; and Ochiai, Michihiko, to Takeda Chemical Industries, Ltd. 1-Sulfo-2-oxoazetidine derivatives and their production. 4,550,105, Cl. 514-210.000.

Matsusaka, Hiroji: *See—*
Morishita, Muneki; Nishimura, Hiroyuki; and Matsusaka, Hiroji, 4,549,661, Cl. 209-534.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Hirauchi, Yukio; Nakano, Kazuhiro; and Harada, Toyohei, 4,549,523, Cl. 126-97.000.
Watanabe, Shuichi; and Katakabe, Noboru, 4,550,302, Cl. 335-228.000.

Matsushita Electric Works, Ltd.: *See—*
Kami, Tomohiro, 4,549,550, Cl. 128-686.000.

Mauri, Jacinto M.: *See—*
Soto, Jose M. P.; Noverola, Armando V.; Mauri, Jacinto M.; and Spickett, Robert G. W., 4,550,116, Cl. 514-327.000.

Mauser-Werke Oberndorf GmbH: *See—*
Hoffmann, Dietrich; and Gotz, Udo, 4,549,488, Cl. 102-503.000.

Maxson, Myron T.: *See—*
Lee, Chi-Long; Maxson, Myron T.; and Rabe, James A., 4,550,125, Cl. 521-117.000.

Maxson, Orwin G.: *See—*
Peterson, Marvin L.; Putnik, Charles F.; and Maxson, Orwin G., 4,549,948, Cl. 204-196.000.

Mazak, Ivan: *See—*
Husak, Zdenek; Svozil, Zdenek; Mazak, Ivan; Lehky, Josef; Hora, Josef; Smid, Zdenek; and Kebrle, Ondrej, 4,549,742, Cl. 280-11.180.

McCabe, Barkman C., Jr. Ozone treatment system for food. 4,549,477, Cl. 99-477.000.

McCain Manufacturing Corporation: *See—*
Weller, Ronald W.; and Drope, Terrence H., 4,549,730, Cl. 271-100.000.

McClung, James A.: *See—*
Bulso, Joseph D., Jr.; Doyle, Stephen D.; and McClung, James A., 4,549,424, Cl. 72-329.000.

McCollum, Gregory J.: *See—*
Makhlouf, Joseph M.; McCollum, Gregory J.; and Kerr, Paul R., 4,550,060, Cl. 428-423.100.

McCollum, Roy L. Sample flow cell for automatic halogen and pH control for water reservoirs. 4,550,011, Cl. 422-68.000.

McElligott, Paul J., Jr., to Pennwalt Corporation. Purification of crude, liquid organosulfonyl chloride. 4,549,993, Cl. 260-543.00R.

McGard, Inc.: *See—*
Taylor, John H., 4,549,569, Cl. 137-382.500.

McGivern, James F., to Beconpatch Limited. Convertible furniture. 4,549,320, Cl. 5-2.00R.

McLean, Kenneth W., to Sperry Corporation. Crop lifter for disc mower-conditioners. 4,549,390, Cl. 56-13.600.

McNeill, Robert E.: *See—*
Betts, Robert E.; Crawford, John F.; and McNeill, Robert E., 4,549,486, Cl. 102-334.000.

McPhail, Andrew T.; Spielvogel, Bernard F.; and Hall, Iris H., to Duke University. Binuclear copper (II) carboxylates formed from amine-carboxyboranes. 4,550,186, Cl. 556-8.000.

McQueen, Robert W.: *See—*
Schadrack, William C., III; McQueen, Robert W.; and Eyerly, Joyce K., 4,549,538, Cl. 128-92.0EB.

McTavish, Mary S.; Stodieck, Robert W.; and Doljack, Frank A., to Raychem Corporation. PTC Circuit protection device. 4,550,301, Cl. 338-20.000.

Medical Engineering Corporation: *See—*
Finney, Roy P., 4,549,530, Cl. 128-1.00R.
Trick, Robert E., 4,549,531, Cl. 128-1.00R.

Medtronic, Inc.: *See—*
Baker, Richard W., 4,550,370, Cl. 364-413.000.

Mehta, Avinash C., to Polaroid Corporation. Blocked vinyl biphenyl compounds. 4,550,214, Cl. 568-643.000.

Mehta, Pradip S., to USM Corporation. Phase separating rotary processor and method. 4,549,810, Cl. 366-75.000.

Meidensha Electric Mfg. Co., Ltd.: *See—*
Fujii, Toshinobu; and Kokado, Akira, 4,550,065, Cl. 429-105.000.

Meinan Machinery Works, Inc.: *See—*
Hasegawa, Katsuji; and Ibuki, Yasuhiro, 4,549,587, Cl. 144-209.00R.

Mellors, Geoffrey W., to Union Carbide Corporation. Suspension bath and process for production of electrolytic manganese dioxide. 4,549,943, Cl. 204-96.000.

Melnikov, Oleg F.: *See—*
Gjulling, Eduard V.; Djugovskaya, Larisa A.; Zabolotny, Dmitry I.; Kovtun, Jury P.; Liptuga, Nikolai I.; Litus, Viktor I.; Sambur, Marina B.; Romanov, Nikolai N.; Tolmachev, Alexei I.; Kirsanov, Alexandr V.; Pisanko, Viktor N.; Melnikov, Oleg F.; and Klochkov, Evgeny I., 4,550,170, Cl. 548-154.000.

Merck & Co., Inc.: *See—*
Baldwin, John J., 4,550,117, Cl. 514-344.000.
Mrozik, Helmut H., 4,550,160, Cl. 536-7.100.

Merck Patent Gesellschaft mit beschrankter Haftung: *See—*
Fischer, Wolfgang; Seitz, Georg; and Krenn, Karl-Dieter, 4,550,083, Cl. 436-42.000.

Merkelbach, Boy, to SKF Industrial Trading & Development Company B.V. Wheel hub unit assemblies. 4,550,237, Cl. 219-121.0LD.

Merritt, Horace L. Tree climbing apparatus. 4,549,633, Cl. 182-135.000.

Mescheryakov, Ivan K.: *See—*
Minenko, Leonid; Belikov, Evgeny V.; Bobryshev, Oleg V.; Klyatis, Lev M.; Mescheryakov, Ivan K.; Osipov, Viktor G.; Osher, Mikhail I.; and Plyakin, Nikolai P., 4,549,760, Cl. 294-88.000.

Meshman, Boris; Kerekes, Thomas A.; Green, Lawrence S.; and Karlinsky, David, to TRE Semiconductor Equipment Corporation. High speed alignment method for wafer stepper. 4,550,374, Cl. 364-490.000.

Meshulam, Eli. Golf ball retrieving apparatus. 4,549,758, Cl. 294-19.200.

Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See—*
Schulz, Ralf-Thilo; and Rapp, Helmut, 4,549,726, Cl. 267-140.500.

Metex Corporation: *See—*
Usher, Peter P.; and Gavaletz, Eugene J., 4,549,741, Cl. 277-236.000.

Mette, Ulrich, to TRW Ehrenreich GmbH & Co. KG. Fastening of a sealing bellows to the joint housing of a ball joint. 4,549,830, Cl. 403-134.000.

Mettler Instrumente AG: *See—*
Baumann, Arthur, 4,549,623, Cl. 177-212.000.

Meuer, Stefan C.: *See—*
Reinherz, Ellis L.; Schlossman, Stuart F.; and Meuer, Stefan C., 4,550,086, Cl. 436-506.000.

Meyer, Benjamin S., to United States Medical Corporation. Artificial joint fixation to bone. 4,549,319, Cl. 623-22.000.

Meyer, Dennis F.; and Schuster, James E., to I.M.S., Inc. Speed controlling apparatus. 4,549,498, Cl. 114-145.00A.

Meyer, Willy: *See—*
Bohner, Beat; Fory, Werner; Gass, Karl; and Meyer, Willy, 4,549,898, Cl. 71-90.000.

Meyers, Stanley T. Sound reproducing system utilizing motional feedback and an improved integrated magnetic structure. 4,550,430, Cl. 381-96.000.

Miale, Joseph N.: *See*—
Chang, Clarence D.; and Miale, Joseph N., 4,550,092, Cl. 502-71.000.

Mich, Thomas F.; and Culbertson, Townley P., to Warner-Lambert Company. Antibacterial 1-oxo-benzoquinolizine-2-carboxylic acids. 4,550,103, Cl. 514-210.000.

Mich, Thomas F.; and Sanchez, Joseph P., to Warner-Lambert Company. Antibacterial thiazolo-quinolines and thiazolo-naphthyridines. 4,550,104, Cl. 514-210.000.

Michael, Dietrich: *See*—
Nielinger, Werner; Hermann, Karl H.; and Michael, Dietrich, 4,550,133, Cl. 524-399.000.

Michiki, Hideyuki: *See*—
Matsumiya, Saburo; Uehara, Katsuya; Saito, Keiji; Michiki, Hideyuki; and Yaginuma, Kenichi, 4,549,904, Cl. 75-7.000.

Microbial Chemistry Research Foundation: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Naganawa, Hiroshi; Sawa, Tsutomu; Uchida, Takeshi; and Imoto, Masaya, 4,550,159, Cl. 536-6.400.

Micronix Partners: *See*—
Jagusch, Peter R.; and Novak, W. Thomas, 4,549,843, Cl. 414-416.000.

Midock, Gary E.: *See*—
Bukowski, James M.; Midock, Gary E.; and Walko, Ronald J., 4,550,380, Cl. 364-494.000.

Miesterfeld, Frederick O. R.: *See*—
Hormel, Ronald F.; and Miesterfeld, Frederick O. R., 4,550,261, Cl. 307-118.000.

Mihm, Gerhard: *See*—
Engel, Wolfhard; Trummlitz, Gunter; Eberlein, Wolfgang; Mihm, Gerhard; Schmidt, Gunther; Hammer, Rudolf; and Giachetti, Antonio, 4,550,107, Cl. 514-220.000.

Mikulecky, Harvey W., to RTE Corporation. Trip assembly for a circuit breaker. 4,550,298, Cl. 335-35.000.

Mikuni Kogyo Kabushiki Kaisha: *See*—
Kamiyama, Shuichi, 4,549,517, Cl. 123-478.000.

Milano, Raymond A., to Rockwell International Corporation. Multilayer modulation doped heterostructure charge coupled device. 4,550,331, Cl. 357-24.000.

Millaway, Steven D.; and Graeme, Jerald G., to Burr-Brown Corporation. Noise-free, die area efficient cascode circuit. 4,550,291, Cl. 330-277.000.

Miller, Claude P.: *See*—
Ganssle, Eugene R.; and Miller, Claude P., 4,550,319, Cl. 343-882.000.

Miller, Lloyd. Fabric mounting track system. 4,549,334, Cl. 29-278.000.

Miller, Richard W.; Nagao, Jay; and Dexter, Steve, to Fairfield Manufacturing Company. Gear reducer. 4,549,449, Cl. 74-785.000.

Miller, Sandra L.: *See*—
Tarjan, Peter P.; Miller, Sandra L.; and Martin, John, 4,549,556, Cl. 128-785.000.

Miller, Stephen D. Insulating material. 4,550,046, Cl. 428-116.000.

Miller, Stewart E., to AT&T Bell Laboratories. Active optical fiber tap. 4,549,782, Cl. 350-96.160.

Miller, Thomas: *See*—
Albertsen, Peter S.; and Miller, Thomas, 4,549,524, Cl. 126-289.000.

Miller, Thomas P. Roller bed vehicle. 4,549,844, Cl. 414-534.000.

Mills, Robert C. Multi-purpose hand tool. 4,549,611, Cl. 172-375.000.

Minami, Kihachiro: *See*—
Wakabayashi, Manabu; Minami, Kihachiro; Sanpei, Tohru; and Konno, Kazutoshi, 4,550,354, Cl. 360-133.000.

Minekane, Tomiharu; Yokotani, Noboru; and Onuma, Takehiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for photometric measurement of light absorption of liquid samples in cuvettes. 4,549,809, Cl. 356-436.000.

Minenko, Leonid; Belikov, Evgeny V.; Bobryshev, Oleg V.; Klyatis, Lev M.; Mescheryakov, Ivan K.; Osipov, Viktor G.; Osher, Mikhail I.; and Plyakin, Nikolai P., to Tsentralnaya Experimentalno-issledovatelskaya Konstruktorsko-Tekhnologicheskaya Laboratoria Khimizatsii Selskogo Khozyaistva. Device for gripping and hoisting packed sacks. 4,549,760, Cl. 294-88.000.

Minkhorst, Jan H. K., to Stamicarbon B.V. Bumper. 4,549,757, Cl. 293-120.000.

Minolta Camera Kabushiki Kaisha: *See*—
Inagaki, Sanji, 4,550,243, Cl. 219-216.000.
Inagaki, Tetsuhiko, 4,549,799, Cl. 354-400.000.
Maeda, Keisuke, 4,549,800, Cl. 354-400.000.

Mishark, Joseph E.: *See*—
Biser, Roger W.; and Mishark, Joseph E., 4,550,320, Cl. 346-75.000.

Mitadera, Takashi: *See*—
Tamba, Shinichi; and Mitadera, Takashi, 4,549,520, Cl. 123-572.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Kojima, Kenji, 4,550,338, Cl. 358-20.000.
Shirai, Mitsuru; Fukuda, Nobuo; Yamamoto, Akira; and Tsuji, Hiroshi, 4,549,603, Cl. 165-104.330.
Yamanaka, Kimio, 4,550,278, Cl. 318-632.000.

Mitsubishi Paper Mills, Limited: *See*—
Kosaka, Takao; and Tsukahara, Hirokazu, 4,550,328, Cl. 346-201.000.

Mitsubishi Plastics Industries Limited: *See*—
Ohtsu, Yoichi; Kanno, Kohei; and Nagano, Hiroshi, 4,550,007, Cl. 264-521.000.

Mitsubishi Rayon Co., Ltd.: *See*—
Kishida, Kazuo; Sasaki, Isao; Mori, Hiroshi; and Ii, Yasuaki, 4,550,130, Cl. 523-436.000.

Mitutoyo Mfg. Co., Ltd.: *See*—
Souji, Ichikawa, 4,549,353, Cl. 33-125.00R.

Miura, Nobuo: *See*—
Sakata, Norihiko; and Miura, Nobuo, 4,550,003, Cl. 264-53.000.

Miura, Yasuki: *See*—
Ono, Masaaki; Miura, Yasuki; Motegi, Masahiko; and Okabe, Kazuo, 4,550,049, Cl. 428-141.000.

Mixich, Georg; and Thiele, Kurt, to Siegfried Aktiengesellschaft. Process for the stereospecific preparation of (Z)-1-(2,4-dichlorophenyl)-2-(imidazol-1-yl)-0-(2,4-dichlorobenzyl)-ethanone oxime ether. 4,550,175, Cl. 548-341.000.

Miyahara, Hatsuo: *See*—
Kabashima, Katsuhiko; Takemae, Yoshihiro; Nozaki, Shigeki; Ohira, Tsuyoshi; Miyahara, Hatsuo; Kanai, Masakazu; and Enomoto, Seiji, 4,550,289, Cl. 324-158.00R.

Miyakawa, Akira, to Canon Kabushiki Kaisha. Device for discharging liquid droplets. 4,550,327, Cl. 346-140.00R.

Miyake, Shuji: *See*—
Ando, Takehiro; Miyake, Shuji; Murakami, Osamu; Kawabata, Takashi; Hayashi, Shigeo; Otonari, Michiyasu; and Kato, Toyoaki, 4,549,835, Cl. 405-4.000.

Miyakoshi, Shinichi; and Hara, Naoto, to Honda Giken Kogyo Kabushiki Kaisha. Arrangement of multiple valves for an internal combustion engine. 4,549,510, Cl. 123-90.270.

Miyasaka, Tsutomu; Kobayashi, Hidetoshi; Itoh, Isamu; and Hirano, Shigeo, to Fuji Photo Film Co., Ltd. Direct positive silver halide photographic light-sensitive materials. 4,550,070, Cl. 430-202.000.

Miyazaki, Katuto: *See*—
Hirosawa, Toshio; Ohki, Masaru; Miyazaki, Katuto; Kobayashi, Nobuo; and Koizumi, Naoko, 4,550,386, Cl. 364-900.000.

Mizukami, Teruo: *See*—
Sugino, Toshiya; Nohara, Fujio; Fujinawa, Tomoaki; Ogawa, Kazuo; Mizukami, Teruo; and Shirai, Shunichi, 4,550,118, Cl. 514-383.000.

Mizuno, Takeyuki, to NGK Insulators, Ltd. Method of producing radial type ceramic turbine rotor. 4,550,004, Cl. 264-63.000.

Mobay Chemical Corporation: *See*—
Morris, Susan M.; Thomas, Thomas J.; and Kalz, Dietmar, 4,549,980, Cl. 252-301.230.

Mobil Oil Corporation: *See*—
Chang, Clarence D.; and Miale, Joseph N., 4,550,092, Cl. 502-71.000.
Chu, Pochen, 4,549,956, Cl. 208-120.000.
Chu, Pochen, 4,550,218, Cl. 585-408.000.
Degnan, Thomas F.; and Farcasiu, Malvina, 4,550,090, Cl. 502-25.000.
Garwood, William E.; Kuo, James C.; Jacob, Solomon M.; and Wise, John J., 4,549,396, Cl. 60-39.020.
Graziani, Kenneth R.; and Sapre, Ajit V., 4,550,217, Cl. 585-324.000.
Horodysky, Andrew G., 4,549,974, Cl. 252-33.600.
Horodysky, Andrew G., 4,549,975, Cl. 252-49.600.
Horodysky, Andrew G.; and Landis, Phillip S., 4,549,976, Cl. 252-49.800.
Huffhines, Donald F.; and Roach, Robert E., 4,549,499, Cl. 114-244.000.
Penick, Joe E., 4,550,012, Cl. 422-106.000.
Shih, Stuart S., 4,549,955, Cl. 208-59.000.
Soeiinah, Edy, 4,549,431, Cl. 73-151.000.
Stowe, Lawrence R.; and Strubhar, Malcolm K., 4,549,608, Cl. 166-280.000.
Venkat, Chaya; and Walsh, Dennis E., 4,549,815, Cl. 374-8.000.

Mockli, Peter, to Ciba Geigy Corporation. 2-(Oxo, or thio)-3-substituted 1,3-benzothiazolyl-4-cyano-7-substituted amino-benzopyrans. 4,550,171, Cl. 548-159.000.

Moles, Warren H.: *See*—
Dischert, Robert A.; Moles, Warren H.; Rhodes, Roland N.; and Walter, James M., 4,550,337, Cl. 358-13.000.

Molins Machine Company, Inc.: *See*—
Craemer, Robert H., 4,550,377, Cl. 364-471.000.

Molins plc: *See*—
Applegate, Barry G., 4,549,645, Cl. 198-408.000.

Moller, Kurt: *See*—
Wyskott, Bernd; Prange, Rainer; Moller, Kurt; and Fleischer, Joachim, 4,549,906, Cl. 106-16.000.

Monarch Marking Systems, Inc.: *See*—
Makley, James A., 4,549,483, Cl. 101-45.000.

Monarch Tool & Manufacturing Co.: *See*—
Hall, Mitchell A., 4,549,418, Cl. 70-85.000.

Monnier, Jean-Pierre, to L'Air Liquide, Societe Anonyme Pour l'Etude et l'Exploitation des Procedes Georges Claude. Gas mixers. 4,549,563, Cl. 137-100.000.

Montedison S.p.A.: *See*—
Venturello, Carlo; and Ricci, Marco, 4,550,196, Cl. 562-418.000.

Montgomery, Susan R.: *See*—
Schiffner, Robert E.; and Montgomery, Susan R., 4,549,811, Cl. 366-129.000.

Montigny, Jean, to Centrale Laitiere de Haute Normandie. Method of re-suspending flocculated milk casein to obtain protein enriched dairy raw material. 4,550,028, Cl. 426-582.000.

Mookherjee, Braja D.; Trenkle, Robert W.; Wolff, Robin K.; Boden, Richard M.; and Yoshida, Takao, to International Flavors & Fragrances, Inc. Methyl substituted pinyl oxopentenes, organoleptic uses thereof and process for preparing same. 4,549,971, Cl. 252-8.600.

Mookherjee, Braja D.: *See*—
Evers, William J.; Mookherjee, Braja D.; Van Ouwerkerk, Anton; and Van Loveren, Augustinus G., 4,549,972, Cl. 252-8.600.
Moon, Seaton: *See*—
Herr, Herbert W.; Moon, Seaton; and Hopper, James E., 4,549,744, Cl. 280-415.00A.
Moon, William F. Air filtering face mask. 4,549,543, Cl. 128-206.120.
Moran, Daniel B.; Powell, Dennis W.; and Albright, Jay D., to American Cyanamid Company. (Pyridinyl)-1,2,4-triazolo[4,3-a]pyridines. 4,550,166, Cl. 546-119.000.
Morelle, Claude: *See*—
Creel, Georges N.; and Morelle, Claude, 4,549,814, Cl. 374-2.000.
Morgan, David W.: *See*—
Araujo, Roger J.; Hares, George B.; Kerko, David J.; Morgan, David W.; and Morse, David L., 4,549,894, Cl. 65-30.110.
Kerko, David J.; Morgan, David W.; and Thompson, Richard W., 4,550,087, Cl. 501-13.000.
Mori, Hiroshi: *See*—
Kishida, Kazuo; Sasaki, Isao; Mori, Hiroshi; and Ii, Yasuaki, 4,550,130, Cl. 523-436.000.
Moriconi, Emil: *See*—
Doswald, Paul; Moriconi, Emil; Moser, Helmut; and Schmid, Horst, 4,550,158, Cl. 534-605.000.
Moriguchi, Seki: *See*—
Yamamoto, Kunio; Ichikawa, Kaoru; and Moriguchi, Seki, 4,549,681, Cl. 227-8.000.
Morin, Daniel; and Prechner, Roland, to Societe Nationale Elf Aquitaine (Production). Process and device for filling chromatography columns. 4,549,584, Cl. 141-73.000.
Morishita, Muneki; Nishimura, Hiroyuki; and Matsusaka, Hiroji, to Omron Tateisi Electronics Co. Bank note processing device. 4,549,661, Cl. 209-534.000.
Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Junichi; and Ukigai, Toshiyuki, to Lion Corporation. Micellar slug for oil recovery. 4,549,607, Cl. 166-274.000.
Morita, Masayuki: *See*—
Kimura, Mitsutoshi; and Morita, Masayuki, 4,550,272, Cl. 315-86.000.
Moriyama, Masakazu; and Saito, Takao, to Toyota Jidosha Kabushiki Kaisha. Drive guide display system for motor vehicle. 4,550,317, Cl. 340-995.000.
Morris, Jeffrey D.; and Fuller, Robert A., to Cosden Technology, Inc. Process for producing styrenic/alkenylnitrile copolymers. 4,550,149, Cl. 526-68.000.
Morris, Susan M.; Thomas, Thomas J.; and Kalz, Dietmar, to Mobay Chemical Corporation. White modification of a bis-triazinyl amino stilbene optical brightener and a process for making the same. 4,549,980, Cl. 252-301.230.
Morrison, Glenn C., to Warner-Lambert Company. 2,4-Dihydro-5-[(substituted)phenyl]-4,4-disubstituted-3H-pyrazol-3-ones. 4,550,119, Cl. 514-394.000.
Morse, David L.: *See*—
Araujo, Roger J.; Hares, George B.; Kerko, David J.; Morgan, David W.; and Morse, David L., 4,549,894, Cl. 65-30.110.
Morton Thiokol, Inc.: *See*—
Hawkins, David K.; and Sauvageau, Donald R., 4,549,464, Cl. 89-1.809.
Moser, Helmut: *See*—
Doswald, Paul; Moriconi, Emil; Moser, Helmut; and Schmid, Horst, 4,550,158, Cl. 534-605.000.
Moss, William H.: *See*—
Keyes, Marion A., IV; Lukas, Michael P.; and Moss, William H., 4,549,503, Cl. 122-479.00R.
Mostek Corporation: *See*—
Sheppard Douglas P., 4,549,336, Cl. 29-576.00B.
Motegi, Masahiko: *See*—
Ono, Masaaki; Miura, Yasuki; Motegi, Masahiko; and Okabe, Kazuo, 4,550,049, Cl. 428-141.000.
Motorola, Inc.: *See*—
Burbank, Raymond W.; and Myers, Christopher A., 4,550,429, Cl. 381-90.000.
Freeburg, Thomas A., 4,550,443, Cl. 455-33.000.
Gillig, Steven F.; Fergus, George H.; and Barnes, Michael F., 4,550,426, Cl. 381-46.000.
Henderson, James A., Jr.; and Tennant, Chris B., 4,550,400, Cl. 370-85.000.
Mourao, Antonio M., to Texaco Inc. Diesel oil containing monoalkoxylated nonyl phenol characterized by decrease in visible smoke in exhaust gases. 4,549,884, Cl. 44-57.000.
Mouri, Yasunori: *See*—
Abe, Osamu; Mouri, Yasunori; and Sugiura, Noboru, 4,549,514, Cl. 123-425.000.
Mowill, Rolf J.: *See*—
Stroem, Sigmunn; and Mowill, Rolf J., 4,549,847, Cl. 415-182.000.
Mrozik, Helmut H., to Merck & Co., Inc. Processes for the interconversion of C-076 compounds. 4,550,160, Cl. 536-7.100.
Muccitelli, John A., to Betz Laboratories, Inc. Method of utilizing improved stability oxygen scavenger compositions. 4,549,968, Cl. 210-750.000.
Mueller, Wayne A.; and Schuette, Scott D., to HEI, Inc. Cordless digital graphics input device. 4,550,250, Cl. 250-203.00R.
Mullins, John M., to Hughes Tool Company - USA. Opposed button thrust surfaces for earth boring bits. 4,549,820, Cl. 384-95.000.
Mumby, Edward S., to Exploration Logging, Inc. Apparatus for well logging telemetry. 4,550,392, Cl. 367-82.000.
Muntz, Eric P.: *See*—
Sve, Charles; and Muntz, Eric P., 4,550,255, Cl. 250-359.100.
Murakami, Osamu: *See*—
Ando, Takehiro; Miyake, Shuji; Murakami, Osamu; Kawabata, Takashi; Hayashi, Shigeo; Otonari, Michiyasu; and Kato, Toyoaki, 4,549,835, Cl. 405-4.000.
Murakami, Yoshiaki: *See*—
Yanagishima, Takayuki; Kasai, Junichi; Ajimine, Akio; Watanabe, Tatsuya; Shino, Akimitsu; and Murakami, Yoshiaki, 4,550,428, Cl. 381-86.000.
Murakoshi, Masaaki: *See*—
Toyama, Fumiyasu; Murakoshi, Masaaki; Wakuda, Masanori; Sasaki, Junichi; Watanabe, Hirotoshi; Yukawa, Tomio; and Okayama, Yoshihiko, 4,550,366, Cl. 364-136.000.
Muramoto, Yutaka; and Ikegami, Taketoshi, to Terumo Kabushiki Kaisha. Electronic clinical thermometer. 4,549,819, Cl. 374-178.000.
Muraoka, Toshiharu: *See*—
Chikazawa, Nobumoto; Muraoka, Toshiharu; and Fujii, Setsuro, 4,550,076, Cl. 435-18.000.
Murata Kikai Kabushiki Kaisha: *See*—
Kimura, Hidetoshi, 4,549,392, Cl. 57-22.000.
Murayama, Koushou: *See*—
Tachibana, Eiichi; Murayama, Koushou; and Isumi, Kenzo, 4,549,923, Cl. 156-423.000.
Murbach, Erwin; and Peter, Jean, to Zellweger Uster Ltd. Device for the determination of the amount of substance or the density of fiber structures. 4,549,428, Cl. 73-32.00R.
Murib, Jawad H.; and Kahn, John H., to National Distillers and Chemical Corporation. Process for preparing gamma-caprolactone from polycaprolactone. 4,550,181, Cl. 549-326.000.
Murphy, Marjorie M. Reversible shadow multicolored trapunto. 4,549,494, Cl. 112-266.100.
Murphy Oil Company Limited: *See*—
Bland, Linden; and Anderson, Clifford J., 4,549,432, Cl. 73-200.000.
Murray, David G.: *See*—
Duncan, Charles W.; and Murray, David G., 4,549,634, Cl. 182-179.000.
Musser, John H.; and Tio, Cesario O., to American Home Products Corporation. Novel heterocyclic compounds as antiallergic agents. 4,550,172, Cl. 548-180.000.
Myers, Christopher A.: *See*—
Burbank, Raymond W.; and Myers, Christopher A., 4,550,429, Cl. 381-90.000.
Myers, Robert A., to Owens-Illinois, Inc. Blow molding apparatus. 4,549,865, Cl. 425-342.100.
Myerson, Allan S., to Georgia Tech Research Institute. Purification of terephthalic acid by supercritical fluid extraction. 4,550,198, Cl. 560-486.000.
Nagamine, Tsuyoshi: *See*—
Nozawa, Ryoichiro; Nagamine, Tsuyoshi; and Shima, Atsushi, 4,550,378, Cl. 364-474.000.
Naganawa, Hiroshi: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Naganawa, Hiroshi; Sawa, Tsutomu; Uchida, Takeshi; and Imoto, Masaya, 4,550,159, Cl. 536-6.400.
Nagano, Hiroshi: *See*—
Ohtsu, Yoichi; Kanno, Kohei; and Nagano, Hiroshi, 4,550,007, Cl. 264-521.000.
Nagano, Jun: *See*—
Yazaki, Susumu; and Nagano, Jun, 4,549,453, Cl. 83-365.000.
Nagao, Jay: *See*—
Miller, Richard W.; Nagao, Jay; and Dexter, Steve, 4,549,449, Cl. 74-785.000.
Nagasawa, Kouichi; Ikeda, Shuji; Suzuki, Norio; and Sakai, Yoshio, to Hitachi, Ltd. Method of making CMOS semiconductor device using specially positioned, retained masks, and product formed thereby. 4,549,340, Cl. 29-571.000.
Nagatani, Yoshiteru: *See*—
Endo, Mitsushi; Taniguchi, Toshiaki; Sahara, Teruyoshi; Hayakawa, Noriyuki; Yoshitomi, Tatsuo; Takahashi, Kozo; Nagatani, Yoshiteru; Kawai, Hidenao; Kaizyo, Shuichi; Nakagawa, Yoichi; Yamagami, Kazuo; Takizawa, Teruo; and Suzuki, Tomio, 4,549,472, Cl. 98-34.600.
Naito, Akihiko, to Pioneer Electronic Corporation. Unauthorized observation preventing device for CATV system. 4,550,341, Cl. 358-114.000.
Naito, Michinori, to Trio Kabushiki Kaisha. Stereo MPX circuit. 4,550,423, Cl. 381-13.000.
Nakadate, Toshihiko; and Numata, Morikuni, to Honda Giken Kogyo Kabushiki Kaisha. Gun arm apparatus for resistance welding gun. 4,550,236, Cl. 219-86.310.
Nakagawa, Yasuyuki, to Asahi Kakoshi Co., Ltd. Dust-proof reinforcing sheet material to be applied over handling opening-formed on wall of box. 4,550,048, Cl. 428-138.000.
Nakagawa, Yoichi: *See*—
Endo, Mitsushi; Taniguchi, Toshiaki; Sahara, Teruyoshi; Hayakawa, Noriyuki; Yoshitomi, Tatsuo; Takahashi, Kozo; Nagatani, Yoshiteru; Kawai, Hidenao; Kaizyo, Shuichi; Nakagawa, Yoichi; Yamagami, Kazuo; Takizawa, Teruo; and Suzuki, Tomio, 4,549,472, Cl. 98-34.600.
Nakamura, Hiroshi: *See*—
Rokutanda, Takashi; and Nakamura, Hiroshi, 4,550,369, Cl. 364-200.000.
Nakamura, Koichi: *See*—
Aono, Toshiaki; and Nakamura, Koichi, 4,550,071, Cl. 430-203.000.

Nakamuta, Shozo, to Pioneer Video Corporation. Method for recording information on a recording disc. 4,550,347, Cl. 358-338.000.

Nakane, Hisashi: *See*—
Uehara, Akira; Hijikata, Isamu; Nakane, Hisashi; and Nakayama, Muneo, 4,550,239, Cl. 219-121.0PG.
Uehara, Akira; Hijikata, Isamu; Nakane, Hisashi; and Nakayama, Muneo, 4,550,242, Cl. 219-121.0PG.

Nakano, Kazuhiro: *See*—
Hirauchi, Yukio; Nakano, Kazuhiro; and Harada, Toyohei, 4,549,523, Cl. 126-97.000.

Nakao, Toshihiro, to Olympus Optical Company Limited. Head adjusting device. 4,550,352, Cl. 360-109.000.

Nakashima, Akio: *See*—
Imada, Yosinobu; and Nakashima, Akio, 4,550,348, Cl. 358-342.000.

Nakashimizu, Takeo: *See*—
Matsumoto, Seishi; Nakashimizu, Takeo; and Abe, Yuji, 4,549,617, Cl. 177-1.000.

Nakatani, Nobuyuki, to Olympus Optical Co., Ltd. Video camera apparatus. 4,550,343, Cl. 358-229.000.

Nakayama, Muneo: *See*—
Uehara, Akira; Hijikata, Isamu; Nakane, Hisashi; and Nakayama, Muneo, 4,550,239, Cl. 219-121.0PG.
Uehara, Akira; Hijikata, Isamu; Nakane, Hisashi; and Nakayama, Muneo, 4,550,242, Cl. 219-121.0PG.

Nalco Chemical Company: *See*—
Branning, Merle L., 4,549,967, Cl. 210-728.000.

Namdari, Bahram. Apparatus for washing animals. 4,549,502, Cl. 119-158.000.

Namizuka, Toshio: *See*—
Akita, Shuichi; and Namizuka, Toshio, 4,550,142, Cl. 525-236.000.

Narang, Rajendra K. Oil and gas water heater. 4,549,525, Cl. 126-361.000.

Nardi, Dante; Tajana, Alberto; Pennini, Renzo; Cazzulani, Pietro; Graziani, Gabriele; and Casadio, Silvano, to Recordati S.A., Chemical & Pharmaceutical Company. Certain piperidino-lower-alkylene esters of 3-methylflavone-8-carboxylates possessing smooth muscle relaxant activity. 4,550,115, Cl. 514-320.000.

Nassof, Martin, to Simplex Ceiling Corporation. Ceiling construction. 4,549,375, Cl. 52-39.000.

National Distillers and Chemical Corporation: *See*—
Murib, Jawad H.; and Kahn, John H., 4,550,181, Cl. 549-326.000.

National Industries, Inc.: *See*—
Kitchens, Roy A., 4,550,220, Cl. 174-138.00F.

National Machinery Company, The: *See*—
Wisebaker, Robert E.; and Edmondson, Richard, 4,549,425, Cl. 72-422.000.

National Research Development Corporation: *See*—
Hashmi, Mohammed S. J.; and Symmons, George R., 4,549,421, Cl. 72-41.000.
Hider, Robert C.; Kontoghiorghes, George; Silver, Jack; and Stockham, Michael A., 4,550,101, Cl. 514-188.000.

National Semiconductor Corporation: *See*—
Cheng, Fred T. J.; and Sauer, Don R., 4,550,424, Cl. 381-15.000.

Nauchno-Issledovatelsky Institut Po Biologicheskikm Ispytaniyam Khimicheskikh Soedineny: *See*—
Lavretskaya, Elionora F.; Rudzit, Ernest A.; Piruzian, Lev A.; Volkova, Ljubov I.; Zakharova, Nina I.; Sarkisian, David A.; Upadysheva, Alexandra V.; Grigorieva, Natalya D.; Znamenskaya, Anna P.; Libinzon, Rakhil E.; and Antonian, Semen G., 4,550,113, Cl. 514-290.000.

Nawrath, Nikolaus, to M.A.N. Roland-Druckmaschinen Aktiengesellschaft. Paper web seizing apparatus for use with printing machinery. 4,549,485, Cl. 101-219.000.

Neal, Thomas M., to Everett/Charles Test Equipment, Inc. Automatic test program list generation using programmed digital computer. 4,550,406, Cl. 371-20.000.

Neese, Wayne E., to GTE Communication Systems Corporation. Thick film screen printing apparatus. 4,549,484, Cl. 101-123.000.

Neiss, Melvin A.; and Woodruff, Robert W., to Du Pont de Nemours, E. I., and Company. Overcoated photohardenable element having surface protuberances. 4,550,073, Cl. 430-273.000.

Nelson, Larry A.; and Schmidt, Leon W., to Allied Corporation. Analysis system. 4,550,084, Cl. 436-45.000.

New Idea Corporation: *See*—
Groeneveld, Wilbur E.; Kluver, Leroy; and Vincent, Michael T., 4,549,481, Cl. 100-98.00R.

New Regina Corporation: *See*—
Gromek, Francis S.; and Haines, William F., Sr., 4,549,779, Cl. 339-58.000.

Newell, S. David; Matko, William F.; Onoratti, James L.; and Parrott, Lawrence H., to Alco Industries, Inc. Method of making a composite thread protector. 4,549,337, Cl. 29-527.400.

NGK Insulators, Ltd.: *See*—
Kato, Kiminari, 4,550,005, Cl. 264-177.00R.
Mizuno, Takeyuki, 4,550,004, Cl. 264-63.000.

Nguyen, Tan V. Camera case. 4,549,589, Cl. 150-52.00J.

Nicholson, Warren H.; and Pritchard, Dalton H., to RCA Corporation. Apparatus for frame-to-frame comb filtering composite TV signal. 4,550,340, Cl. 358-31.000.

Nichting, Robert P., to Caterpillar Tractor Co. Bearing race retention device and method. 4,549,823, Cl. 384-537.000.

Nielinger, Werner; Hermann, Karl H.; and Michael, Dietrich, to Bayer Aktiengesellschaft. Stabilized red phosphorus and its use for flameproofing thermoplastic polyamide moulding compositions. 4,550,133, Cl. 524-399.000.

Nielsen, Kurt F.: *See*—
Jensen, Niels D.; and Nielsen, Kurt F., 4,549,849, Cl. 415-219.00R.

Nieva, Kenneth J.: *See*—
Lord, Richard G.; and Nieva, Kenneth J., 4,549,403, Cl. 62-201.000.

Nihei, Ryo: *See*—
Torii, Nobutoshi; and Nihei, Ryo, 4,549,846, Cl. 414-729.000.

Nikolich, Milovan, to Signode Corporation. Method of driving fasteners with a bumperless pneumatic gun. 4,549,344, Cl. 29-432.000.

Nimke, Helmut E.; and Thomas, William R., to UMAC, Inc.; and Brooklyn Union Gas Company, a part interest. Connector for tubular members. 4,549,752, Cl. 285-55.000.

Nippon Electric Co., Ltd.: *See*—
Akashi, Mineo; and Kitada, Yoshitaka, 4,550,307, Cl. 340-347.0DA.
Akashi, Tsutomu, 4,550,390, Cl. 365-174.000.

Nippon Infrared Industries Co., Ltd.: *See*—
Toida, Masahiro; Suenaga, Norihiro; and Suenaga, Nobuyuki, 4,550,240, Cl. 219-121.0LS.

Nippon Mektron, Ltd.: *See*—
Matsumoto, Hirofumi, 4,550,357, Cl. 361-398.000.

Nippon Soken, Inc.: *See*—
Tokura, Norihito; Kawai, Hisasi; Kohama, Tokio; and Kanehara, Kenji, 4,550,308, Cl. 340-347.0NT.

Nippon Telegraph & Telephone Public Corporation: *See*—
Omata, Fujio; and Takamoto, Kiichi, 4,550,258, Cl. 260-505.100.

Nippon Zeon Co. Ltd.: *See*—
Akita, Shuichi; and Namizuka, Toshio, 4,550,142, Cl. 525-236.000.

Nippondenso Company Ltd.: *See*—
Takao, Mitsunori; Kimura, Takahiko; and Hirabayashi, Yuzi, 4,549,512, Cl. 123-339.000.
Yamaguchi, Shunzo; Atsumi, Morihiro; and Fukazawa, Takeshi, 4,549,905, Cl. 75-238.000.

Nishikawa, Tsutomu: *See*—
Kasahara, Toshikazu; and Nishikawa, Tsutomu, 4,550,145, Cl. 525-267.000.

Nishikubo, Yasuhiko; Fujikawa, Toyoharu; and Tanaka, Tsutomu, to Citizen Watch Co., Ltd. Temperature detector. 4,549,818, Cl. 374-178.000.

Nishimura, Hiroyuki: *See*—
Morishita, Muneki; Nishimura, Hiroyuki; and Matsusaka, Hiroji, 4,549,661, Cl. 209-534.000.

Nishino, Takaichi, to Tachikawa Spring Co., Ltd. Vehicle seat headrest. 4,549,766, Cl. 297-396.000.

Nissan Motor Co., Ltd.: *See*—
Hirano, Yoshinori, 4,549,505, Cl. 123-41.080.
Yanagishima, Takayuki; Kasai, Junichi; Ajimine, Akio; Watanabe, Tatsuya; Shino, Akimitsu; and Murakami, Yoshiaki, 4,550,428, Cl. 381-86.000.

Nittan Company, Limited: *See*—
Kimura, Tetsuo, 4,550,306, Cl. 340-310.00R.
Kimura, Tetsuo, 4,550,313, Cl. 340-584.000.

Nobis, Dieter: *See*—
Huckler, Volker; Sonns, Eugen; Schafer, Helmut; and Nobis, Dieter, 4,549,637, Cl. 192-3.630.

Noguchi, Kiyoshi: *See*—
Takayama, Suguru; Noguchi, Kiyoshi; and Kobayashi, Kouji, 4,550,062, Cl. 428-611.000.

Nohara, Fujio: *See*—
Sugino, Toshiya; Nohara, Fujio; Fujinawa, Tomoaki; Ogawa, Kazuo; Mizukami, Teruo; and Shirai, Shunichi, 4,550,118, Cl. 514-383.000.

Nolan, Daniel A.: *See*—
Bhagavatula, Venkata A.; and Nolan, Daniel A., 4,549,781, Cl. 350-96.300.

Noranda Inc.: *See*—
Gervais, Edouard; and Levert, Henri, 4,549,598, Cl. 164-66.100.

Norn, Svend: *See*—
Skov, Per S.; Norn, Svend; and Weeke, Bent, 4,550,085, Cl. 436-98.000.

Norrgran, Daniel A.: *See*—
Armstrong, Raynor O.; Norrgran, Daniel A.; and Yuill, William A., 4,549,959, Cl. 209-167.000.

Norris, James R., to United Technologies Corporation. Cowling latch system. 4,549,708, Cl. 244-129.400.

North American Philips Consumer Electronics Corp.: *See*—
Buckley, Michael J., 4,550,344, Cl. 358-248.000.

Northern Telecom Limited: *See*—
Isaacs, Robert B., 4,549,776, Cl. 312-111.000.

Novak, W. Thomas: *See*—
Jagusch, Peter R.; and Novak, W. Thomas, 4,549,843, Cl. 414-416.000.

Noverola, Armando V.: *See*—
Soto, Jose M. P.; Noverola, Armando V.; Mauri, Jacinto M.; and Spickett, Robert G. W., 4,550,116, Cl. 514-327.000.

Nozaki, Shigeki: *See*—
Kabashima, Katsuhiko; Takemae, Yoshihiro; Nozaki, Shigeki; Ohira, Tsuyoshi; Miyahara, Hatsuo; Kanai, Masakazu; and Enomoto, Seiji, 4,550,289, Cl. 324-158.00R.

Nozawa, Ryoichiro; Nagamine, Tsuyoshi; and Shima, Atsushi, to Fanuc Ltd. Method of numerical control and device therefor. 4,550,378, Cl. 364-474.000.

Nu-Tec Incorporated: *See*—
Albertsen, Peter S.; and Miller, Thomas, 4,549,524, Cl. 126-289.000.

Numata, Morikuni: *See*—
Nakadate, Toshihiko; and Numata, Morikuni, 4,550,236, Cl. 219-86.310.

Nunogaki, Yoshiaki; Kobayashi, Tetsuya; and Kosuge, Yasutaka, to Sanki Engineering Co., Ltd. Apparatus for counting numbers of fine particles. 4,550,417, Cl. 377-10.000.
Nunokawa, Hideo: *See*—
Takahaski, Hitoshi; Yamaguchi, Satoru; and Nunokawa, Hideo, 4,550,264, Cl. 307-264.000.
Nutter, Norman E., to General Elecrtric Company. Coupling guard seal assembly. 4,549,740, Cl. 277-189.000.
Nuytten, Rene T., to Can-Dive Services Ltd. Rotary joint. 4,549,753, Cl. 285-95.000.
Obel, Erik M.: *See*—
Hartwig, Carl S. M.; Ljung, Erik A.; and Obel, Erik M., 4,550,282, Cl. 318-808.000.
Ochiai, Masahiko; and Taito, Yoshinori, to Kyushu Hitachi Maxell, Ltd. Washable electric shaver. 4,549,352, Cl. 30-41.500.
Ochiai, Michihiko: *See*—
Matsuo, Taisuke; Kishimoto, Shoji; and Ochiai, Michihiko, 4,550,105, Cl. 514-210.000.
O'Connor, Patrick, to Thermal Power Corporation. Apparatus and method for making snow roads. 4,549,364, Cl. 37-197.000.
Odeau, Michel, to Harris-Marinoni S.A. Suction/air pressure device for slowing down signature in chopper folder of folding machine. 4,549,728, Cl. 270-46.000.
Off, Joseph W. A.; and Early, Judson H., to Haggar Company. Patch pocket and flap constructions. 4,549,916, Cl. 156-93.000.
Ogawa, Kazuo: *See*—
Sugino, Toshiya; Nohara, Fujio; Fujinawa, Tomoaki; Ogawa, Kazuo; Mizukami, Teruo; and Shirai, Shunichi, 4,550,118, Cl. 514-383.000.
Oh, Kye H., to AT&T Bell Laboratories. Integrated circuit contact technique. 4,549,914, Cl. 148-187.000.
Ohe, Takeshi: *See*—
Takeshima, Sadao; and Ohe, Takeshi, 4,549,627, Cl. 180-142.000.
Ohi, Nobukazu; Ohno, Koji; and Kamohara, Hiroshi, to G-C Dental Industrial Corp. Method for strengthening dental restorative material. 4,550,030, Cl. 427-2.000.
Ohira, Tomohiro: *See*—
Kishi, Yoshiki; Hirotani, Toyotoshi; Ohira, Tomohiro; and Fukui, Yukio, 4,550,294, Cl. 332-7.510.
Ohira, Tsuyoshi: *See*—
Kabashima, Katsuhiko; Takemae, Yoshihiro; Nozaki, Shigeki; Ohira, Tsuyoshi; Miyahara, Hatsuo; Kanai, Masakazu; and Enomoto, Seiji, 4,550,289, Cl. 324-158.00R.
Ohki, Masaru: *See*—
Hirosawa, Toshio; Ohki, Masaru; Miyazaki, Katuto; Kobayashi, Nobuo; and Koizumi, Naoko, 4,550,386, Cl. 364-900.000.
Ohno, Akio; and Takeda, Kenji, to Canon Kabushiki Kaisha. Recording apparatus. 4,549,803, Cl. 355-14.0FU.
Ohno, Koji: *See*—
Ohi, Nobukazu; Ohno, Koji; and Kamohara, Hiroshi, 4,550,030, Cl. 427-2.000.
Ohorodnik, Alexander: *See*—
Auer, Eberhard; Gehrmann, Klaus; Ohorodnik, Alexander; and Rosenthal, Johannes, 4,549,995, Cl. 260-973.000.
Ohtaka, Keiji, to Canon Kabushiki Kaisha. Focus detection apparatus. 4,549,802, Cl. 354-403.000.
Ohtsu, Yoichi; Kanno, Kohei; and Nagano, Hiroshi, to Mitsubishi Plastics Industries Limited. Process for production of a plastic bottle. 4,550,007, Cl. 264-521.000.
Oishi, Kengo; and Suzuki, Osamu, to Fuji Photo Film Co., Ltd. Method of making magnetic disk cartridge. 4,549,922, Cl. 156-293.000.
Oishi, Kiyohiko; Kobashi, Kiyoshi; and Takama, Kenichirou, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas cleaning device for diesel engines. 4,549,398, Cl. 60-286.000.
Oka, Takahiro: *See*—
Chiba, Hiromasa; Kumahara, Katsumi; Harada, Takakiyo; Oka, Takahiro; and Sato, Akihiro, 4,550,144, Cl. 525-247.000.
Okabe, Kazuo: *See*—
Ono, Masaaki; Miura, Yasuki; Motegi, Masahiko; and Okabe, Kazuo, 4,550,049, Cl. 428-141.000.
Okahashi, Tatsuo: *See*—
Toyooka, Takashi; Yoshida, Kazutoshi; Ishida, Kazuhiro; Okahashi, Tatsuo; Aoki, Hirokazu; Suzuki, Ryo; and Sugita, Yutaka, 4,550,388, Cl. 365-6.000.
Okamoto, Tsuneo: *See*—
Unno, Yohei; Ueno, Satoru; Sadamitsu, Kazuo; and Okamoto, Tsuneo, 4,549,581, Cl. 138-109.000.
Okayama, Yoshihiko: *See*—
Toyama, Fumiyasu; Murakoshi, Masaaki; Wakuda, Masanori; Sasaki, Junichi; Watanabe, Hirotoshi; Yukawa, Tomio; and Okayama, Yoshihiko, 4,550,366, Cl. 364-136.000.
Oki Electric Industry Co., Ltd.: *See*—
Ayusawa, Kazutoshi; Satoh, Hosaku; and Kazama, Munetada, 4,550,089, Cl. 501-139.000.
Okuyama, Yoshikazu; and Takeuchi, Hajime, to Sony Corporation. Playback speed controller for video tape recorder. 4,550,349, Cl. 360-10.200.
Olin Corporation: *See*—
Gasper, Kenneth E.; and Ehrhart, Raymond G., 4,549,853, Cl. 417-53.000.
Parthasarathi, Arvind; and Polan, Ned W., 4,549,941, Cl. 204-27.000.
Polan, Ned W.; Smialek, Raymond J.; and Parthasarathi, Arvind, 4,549,950, Cl. 204-206.000.
Ollivier, Jean: *See*—
Basset, Jean M. M.; Leconte, Michel; Ollivier, Jean; and Quignard, Francoise, 4,550,216, Cl. 585-645.000.
O'Loughlin, James P., to United States of America, Air Force. High efficiency pulse ultraviolet light source. 4,550,275, Cl. 315-241.00R.
Olympus Optical Company Limited: *See*—
Hashimoto, Tatsutoshi, 4,550,253, Cl. 250-326.000.
Nakao, Toshihiro, 4,550,352, Cl. 360-109.000.
Nakatani, Nobuyuki, 4,550,343, Cl. 358-229.000.
Omata, Fujio; and Takamoto, Kiichi, to Nippon Telegraph & Telephone Public Corporation. Aperture structure for charged beam exposure. 4,550,258, Cl. 260-505.100.
OMI International Corporation: *See*—
Tremmel, Robert A.; and Magda, Doina, 4,549,942, Cl. 204-40.000.
Omron Tateisi Electronics Co.: *See*—
Morishita, Muneki; Nishimura, Hiroyuki; and Matsusaka, Hiroji, 4,549,661, Cl. 209-534.000.
Onder, Kemal: *See*—
Dai, Shenghong A.; Grossman, Steven J.; and Onder, Kemal, 4,550,157, Cl. 528-322.000.
Ono, Masaaki; Miura, Yasuki; Motegi, Masahiko; and Okabe, Kazuo, to Toray Industries, Inc. Laminated film and magnetic recording medium made therewith. 4,550,049, Cl. 428-141.000.
Ono, Masaru: *See*—
Sawano, Yukio; and Ono, Masaru, 4,549,797, Cl. 353-27.00A.
Onoratti, James L.: *See*—
Newell, S. David; Matko, William F.; Onoratti, James L.; and Parrott, Lawrence H., 4,549,337, Cl. 29-527.400.
Onuma, Takehiko: *See*—
Minekane, Tomiharu; Yokotani, Noboru; and Onuma, Takehiko, 4,549,809, Cl. 356-436.000.
Oohara, Riichiro, to Toyo Rubber Industry Co., Ltd., The. Rubber composition with trithiol triazine and cobalt salt. 4,550,147, Cl. 525-332.600.
Ootani, Hisao; and Maruyamano, Satoru, to Toyota Jidosha Kabushiki Kaisha. Clutch disc. 4,549,641, Cl. 192-106.200.
Oppici, Ernesto: *See*—
Dallatomasina, Franco; Ortica, Roberto; Giardino, Pietro; and Oppici, Ernesto, 4,549,987, Cl. 260-112.50R.
Optyl Eyewear Fashion International Corporation: *See*—
Dianitsch, Franz, 4,549,792, Cl. 351-63.000.
Orikasa, Tetsuo, to Hitachi, Ltd. Armature coil winding apparatus for flat motor. 4,549,583, Cl. 140-92.100.
Orth, Walter: *See*—
Busch, Lothar; and Orth, Walter, 4,549,692, Cl. 237-12.30A.
Orthothronics Limited Partnership: *See*—
Fraser, Gregory A.; and Raab, Simon, 4,549,555, Cl. 128-782.000.
Ortica, Roberto: *See*—
Dallatomasina, Franco; Ortica, Roberto; Giardino, Pietro; and Oppici, Ernesto, 4,549,987, Cl. 260-112.50R.
Osa AB: *See*—
Forslund, Torsten E., 4,549,588, Cl. 144-356.000.
Osher, Mikhail I.: *See*—
Minenko, Leonid; Belikov, Evgeny V.; Bobryshev, Oleg V.; Klyatis, Lev M.; Mescheryakov, Ivan K.; Osipov, Viktor G.; Osher, Mikhail I.; and Plyakin, Nikolai P., 4,549,760, Cl. 294-88.000.
Osipov, Viktor G.: *See*—
Minenko, Leonid; Belikov, Evgeny V.; Bobryshev, Oleg V.; Klyatis, Lev M.; Mescheryakov, Ivan K.; Osipov, Viktor G.; Osher, Mikhail I.; and Plyakin, Nikolai P., 4,549,760, Cl. 294-88.000.
Ossi, James M. Paint roller cleaning apparatus. 4,549,562, Cl. 134-138.000.
Osterholtz, Frederick D.: *See*—
Pickwell, Robert J.; and Osterholtz, Frederick D., 4,550,056, Cl. 428-391.000.
Osterhout, Joseph C.: *See*—
Gupta, Tapan K.; Carlson, William G.; Osterhout, Joseph C.; Boyette, Gerald B.; and Sweetana, Andrew S., Jr., 4,549,981, Cl. 252-518.000.
Ota, Seiiti: *See*—
Satsuki, Teruhisa; and Ota, Seiiti, 4,549,984, Cl. 252-532.000.
Otomo, Kikuo: *See*—
Gonda, Michihiro; Kitsukawa, Katsumasa; Suzuka, Susumu; Kanasugi, Mikiko; Sato, Yutaka; and Otomo, Kikuo, 4,550,329, Cl. 346-214.000.
Otonari, Michiyasu: *See*—
Ando, Takehiro; Miyake, Shuji; Murakami, Osamu; Kawabata, Takashi; Hayashi, Shigeo; Otonari, Michiyasu; and Kato, Toyoaki, 4,549,835, Cl. 405-4.000.
Otsuji, Shogo: *See*—
Yamada, Hideaki; Otsuji, Shogo; Isobe, Kimiyasu; Matsunaga, Kuniyoshi; and Inukai, Tadahiko, 4,550,078, Cl. 435-25.000.
Otsuka Pharmaceutical Co., Ltd.: *See*—
Sugino, Toshiya; Nohara, Fujio; Fujinawa, Tomoaki; Ogawa, Kazuo; Mizukami, Teruo; and Shirai, Shunichi, 4,550,118, Cl. 514-383.000.
Otto, Gunther; and Warmbold, Gert, to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Apparatus for recording X-ray radiation pictures, in particular in the cosmic space. 4,550,420, Cl. 378-171.000.
Outboard Marine Corporation: *See*—
Guinn, Douglas B., 4,549,949, Cl. 204-197.000.
Owens-Corning Fiberglas Corporation: *See*—
Streicher, William L.; and Propster, Mark A., 4,549,896, Cl. 65-135.000.

Owens-Illinois, Inc.: *See*—
Dullabaun, Paul W., 4,549,667, Cl. 215-252.000.
Myers, Robert A., 4,549,865, Cl. 425-342.100.

Owers, Ian A.: *See*—
Galloway, John L.; Hankins, Timothy R. F.; and Owers, Ian A., 4,550,311, Cl. 340-531.000.

Oy Wartsila Ab: *See*—
Korppoo, Seppo; and Hanel, Henry, 4,549,626, Cl. 180-127.000.

Ozmon, Laird M.; and Welch, Stephen R. Expandable file folder. 4,549,688, Cl. 229-1.50R.

Paar, Willibald; and Honig, Helmut, to Vianova Kunstharz, A.G. Paint binders carrying oxazolidine groups and process for producing such binders. 4,550,146, Cl. 525-327.300.

Packaging Corporation of America: *See*—
Champlin, Charles L., 4,549,650, Cl. 206-179.000.

Paddock, Charles F.; and Wefer, John M., to Uniroyal, Inc. Polycarbonate compositions with improved low temperature impact strength. 4,550,138, Cl. 525-67.000.

Paerels, Gerard B.; and Raven, Cornelis W., to Duphar International Research B.V. Diphenyl ethers having herbicidal activity. 4,550,205, Cl. 564-166.000.

Paez, Carlos A., to Grumman Aerospace Corporation. Method for superplastic forming and diffusion bonding Y shaped support structures. 4,549,685, Cl. 228-118.000.

Page, Philip R.; and Villax, Ivan, to Plurichemie Anstalt. Homogeneous catalytic system comprising rhodium, hydrazine and phosphine and a process for the preparation of same. 4,550,096, Cl. 502-166.000.

Pagliaro, Robert H., Jr.: *See*—
Corboy, John F., Jr.; Jastrzebski, Lubomir L.; Blackstone, Scott C.; and Pagliaro, Robert H., Jr., 4,549,926, Cl. 156-612.000.

Palmer, James L.: *See*—
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Hettinger, William P., Jr.; Kovach, Stephen M.; Palmer, James L.; and Zandona, Oliver J., 4,549,958, Cl. 208-253.000.

Pampalone, Thomas R., to American Hoechst Corporation. Positive photoresist compositions with o-quinone diazide, novolak, and propylene glycol alkyl ether acetate. 4,550,069, Cl. 430-165.000.

Papp, John E.; and Reed, Antony S., to Standard Precision, Inc. Ball bearing slide with removable and lockable inner slide member. 4,549,773, Cl. 308-3.800.

Paramount Packaging Corporation: *See*—
Peppiatt, Harry R.; and Thomas, John S., 4,550,439, Cl. 383-8.000.

Pariani, Emilio, to Costruzioni Aeronautiche Giovanni Agusta S.p.A. Helicopter rotor. 4,549,851, Cl. 416-140.000.

Park, Hyun D.; and Brown, Arthur E., to Union Carbide Corporation. Ceramic composition for dielectric in multilayer capacitors. 4,550,088, Cl. 501-135.000.

Parker-Hannifin Corporation: *See*—
Sharp, Bernard C., 4,549,791, Cl. 350-632.000.

Parker, John A.: *See*—
Kumar, Devendra; Fohlen, George M.; and Parker, John A., 4,550,177, Cl. 548-413.000.

Parrott, Lawrence H.: *See*—
Newell, S. David; Matko, William F.; Onoratti, James L.; and Parrott, Lawrence H., 4,549,337, Cl. 29-527.400.

Parthasarathi, Arvind; and Polan, Ned W., to Olin Corporation. Electrochemical surface preparation for improving the adhesive properties of metallic surfaces. 4,549,941, Cl. 204-27.000.

Parthasarathi, Arvind: *See*—
Polan, Ned W.; Smialek, Raymond J.; and Parthasarathi, Arvind, 4,549,950, Cl. 204-206.000.

Patel, Gordhanbhai N.; Preziosi, Anthony F.; Bhattacharjee, Himangshu R.; and Lee, Lester T. C., to Allied Corporation. Coloration of acetylenic monomers by gases. 4,550,150, Cl. 526-233.000.

Patillo, Glenn. Method and tool for removing floor covering. 4,549,350, Cl. 30-170.000.

Pattern Processing Technologies, Inc.: *See*—
Werth, Larry J.; and Paulson, Larry G., 4,550,431, Cl. 382-1.000.

Paul Vom Stein & Co.: *See*—
Schroder, Dieter, 4,549,592, Cl. 152-328.000.

Paulson, Larry G.: *See*—
Werth, Larry J.; and Paulson, Larry G., 4,550,431, Cl. 382-1.000.

Paust, Joachim: *See*—
Ernst, Hansgeorg; Gehrken, Henning-Peter; and Paust, Joachim, 4,550,182, Cl. 549-408.000.

Payne, Kenneth R.: *See*—
Stenzel, Wallace I.; and Payne, Kenneth R., 4,550,314, Cl. 340-623.000.

Pebea N.V.: *See*—
Brechbuhler, Fritz, 4,549,384, Cl. 52-704.000.

Pedersen, John N.: *See*—
Kelly, P. Richard; and Pedersen, John N., 4,549,546, Cl. 128-419.00F.

Pekar, Howard G.: *See*—
Kinkelaar, Edmund W.; and Pekar, Howard G., 4,550,037, Cl. 427-443.100.

Pelc, Norbert J.: *See*—
Glover, Gary H.; and Pelc, Norbert J., 4,550,371, Cl. 364-414.000.

Penick, Joe E., to Mobil Oil Corp. Multi-phase countercurrent reactor system. 4,550,012, Cl. 422-106.000.

Pennington, Keith S.: *See*—
Sachdev, Krishna G.; Shear, Stephen A.; Pennington, Keith S.; and Cohen, Mitchell S., 4,550,061, Cl. 428-461.000.

Pennini, Renzo: *See*—
Nardi, Dante; Tajana, Alberto; Pennini, Renzo; Cazzulani, Pietro; Graziani, Gabriele; and Casadio, Silvano, 4,550,115, Cl. 514-320.000.

Pennwalt Corporation: *See*—
McElligott, Paul J., Jr., 4,549,993, Cl. 260-543.00R.

Peppiatt, Harry R.; and Thomas, John S., to Paramount Packaging Corporation. Plastic bag with carrying handle. 4,550,439, Cl. 383-8.000.

Perfection Spring & Stamping Corp.: *See*—
Seyler, Peter G., 4,549,325, Cl. 10-86.00R.

Perilloux, Milton, Jr. Combination table saw. 4,549,455, Cl. 83-477.200.

Peroxid-Chemie GmbH: *See*—
Krauss, Robert; and Binder, Klaus, 4,549,668, Cl. 220-203.000.

Perrot, Jacques; and Thominet, Michel, to Societe d'Etudes Scientifiques et Industrielles de l'Ile-de France. N-(1-Allyl-2-pyrrolidinylmethyl) 2-methoxy-4-amino-5-methylsulfamoyl benzamide. 4,550,179, Cl. 548-571.000.

Perrott, Lynn F.: *See*—
Corbett, Scott S., Jr.; Perrott, Lynn F.; and Reiersgaard, William L., 4,549,663, Cl. 211-13.000.

Perry, Steven B.: *See*—
Lynch, Daniel; and Perry, Steven B., 4,550,225, Cl. 179-81.00R.

Peruzzi, Federigo: *See*—
Andrione, Norbert; and Peruzzi, Federigo, 4,549,859, Cl. 417-363.000.

Pester Refining Company: *See*—
Allen, Jerry R., 4,549,834, Cl. 404-75.000.

Peter, Jean: *See*—
Murbach, Erwin; and Peter, Jean, 4,549,428, Cl. 73-32.00R.

Peterman, Milton J.: *See*—
Gowan, Norman H.; Petravicius, Stasys; Hernandez, Ignacio T.; Kuhlmann, Robert E.; Vande Walle, Donald R., Jr.; Weddell, Ronald P.; Gates, Joseph M.; Sitzwohl, Kenneth J.; Sands, Charles D.; Gwinn, Rick A.; and Peterman, Milton J., 4,549,664, Cl. 211-131.000.

Petermann, Klaus: *See*—
Marten, Peter; and Petermann, Klaus, 4,549,806, Cl. 356-350.000.

Peterson, Edward C.: *See*—
Martin, William J.; Carr, Keith E.; and Peterson, Edward C., 4,549,328, Cl. 15-338.000.

Peterson, Marvin L.; Putnik, Charles F.; and Maxson, Orwin G., to Conoco Inc. Sacrificial anode composition. 4,549,948, Cl. 204-196.000.

Peterson, Richard W.: *See*—
VanPelt, Wilbur F.; and Peterson, Richard W., 4,550,422, Cl. 378-207.000.

Petery, James J.: *See*—
Federico, Anthony M.; Legg, Ernest L.; Wiiczek, Stephen P.; Prasad, Hari K.; and Petery, James J., 4,550,382, Cl. 364-572.000.

Petrarch Systems, Inc.: *See*—
Arkles, Barry C., 4,550,139, Cl. 525-90.000.

Petravicius, Stasys: *See*—
Gowan, Norman H.; Petravicius, Stasys; Hernandez, Ignacio T.; Kuhlmann, Robert E.; Vande Walle, Donald R., Jr.; Weddell, Ronald P.; Gates, Joseph M.; Sitzwohl, Kenneth J.; Sands, Charles D.; Gwinn, Rick A.; and Peterman, Milton J., 4,549,664, Cl. 211-131.000.

Petroff, Lenin J.: *See*—
Chandra, Grish; Kosal, Jeffrey A.; Petroff, Lenin J.; and Pluedemann, Edwin P., 4,549,979, Cl. 252-135.000.

Petroliam Nasional Berhad: *See*—
Seng, Yeoh C.; and Fong, Chen S., 4,549,897, Cl. 71-3.000.

Pettit, George D.: *See*—
Jackson, Thomas N.; Kirchner, Peter D.; Pettit, George D.; Rosenberg, James J.; Woodall, Jerry M.; and Wright, Steven L., 4,550,047, Cl. 428-136.000.

Pfaff Industriemaschinen GmbH: *See*—
Albrecht, Ernst; and Busch, Edgar, 4,549,491, Cl. 112-73.000.
Albrecht, Ernst; and Busch, Edgar, 4,549,492, Cl. 112-76.000.

Pfeiler, Manfred: *See*—
Aichinger, Horst; Marhoff, Paul; and Pfeiler, Manfred, 4,550,419, Cl. 378-099.000.

Pfeiler, William A.: *See*—
Holcombe, Cressie E.; Masters, David R.; and Pfeiler, William A., 4,550,412, Cl. 373-155.000.

Pfizer Inc.: *See*—
Goldman, Irving M.; Kuhla, Donald E.; and Sklavounos, Constantine, 4,550,164, Cl. 544-291.000.

Phan, Albert: *See*—
Auberon, Marcel; Cabanel, Daniel; Dolbeau, Michel; Phan, Albert; Pillois, Philippe; Bournazel, Claude L.; and Huvey, Michel, 4,549,919, Cl. 156-172.000.

Phifer, Edward H.: *See*—
Hemphill, Dean P.; and Phifer, Edward H., 4,549,836, Cl. 405-61.000.

Philibert, Pierre: *See*—
Ancel, Christian; and Philibert, Pierre, 4,549,594, Cl. 152-359.000.

Phillips Petroleum Company: *See*—
Cheng, Paul J., 4,550,013, Cl. 422-151.000.
Drake, Charles A., 4,550,097, Cl. 502-170.000.
Layton, James E., 4,550,263, Cl. 307-261.000.
Lindstrom, Merlin R., 4,549,945, Cl. 204-159.110.
Shioyama, Tod K., 4,550,212, Cl. 568-401.000.

Phipps, Joe: *See—*
Prengaman, Richard J.; Thurber, Robert E.; Phipps, Joe; Greenberg, Ronald I.; Hom, Wai L.; Jaworski, James F.; and Riffle, Guy W., 4,550,318, Cl. 343-5.0PD.
PIACT: *See—*
Free, Michael J., 4,549,652, Cl. 206-363.000.
Pickwell, Robert J.; and Osterholtz, Frederick D., to Union Carbide Corporation. Electrical cable containing cured elastomeric compositions. 4,550,056, Cl. 428-391.000.
Pierce, R. Neal: *See—*
Price, Fred D.; and Pierce, R. Neal, 4,549,778, Cl. 339-40.000.
Pierrat, Michel A. Orbital speed reducer with compensation coupling. 4,549,450, Cl. 74-805.000.
Pilarski, Regis V., to General Motors Corporation. Belt clamping guide loop. 4,549,769, Cl. 297-483.000.
Pilati, Luciano: *See—*
Belforte, Piero; Garetti, Enzo; and Pilati, Luciano, 4,550,398, Cl. 370-66.000.
Pilgram, Kurt H.; and Skiles, Richard D., to Shell Oil Company. (2-Substituted-2,3-dihydrobenzo-furan-7-yl)diazenecarboxylic acid esters and miticidal method. 4,550,121, Cl. 514-469.000.
Pillois, Philippe: *See—*
Auberon, Marcel; Cabanel, Daniel; Dolbeau, Michel; Phan, Albert; Pillois, Philippe; Bournazel, Claude L.; and Huvey, Michel, 4,549,919, Cl. 156-172.000.
Pineau, Jean, to Le Materiel de Voirie. Street sweeper with elevator conveyer adjustable in height with respect to the ground. 4,549,326, Cl. 15-84.000.
Pioneer Electronic Corporation: *See—*
Hatano, Hideki, 4,550,346, Cl. 358-330.000.
Naito, Akihiko, 4,550,341, Cl. 358-114.000.
Pioneer Video Corporation: *See—*
Nakamuta, Shozo, 4,550,347, Cl. 358-338.000.
Piruzian, Lev A.: *See—*
Lavretskaya, Elionora F.; Rudzit, Ernest A.; Piruzian, Lev A.; Volkova, Ljubov I.; Zakharova, Nina I.; Sarkisian, David A.; Upadysheva, Alexandra V.; Grigorieva, Natalya D.; Znamenskaya, Anna P.; Libinzon, Rakhil E.; and Antonian, Semen G., 4,550,113, Cl. 514-290.000.
Pisanko, Viktor N.: *See—*
Gjulling, Eduard V.; Djugovskaya, Larisa A.; Zabolotny, Dmitry I.; Kovtun, Jury P.; Liptuga, Nikolai I.; Litus, Viktor I.; Sambur, Marina B.; Romanov, Nikolai N.; Tolmachev, Alexei I.; Kirsanov, Alexandr V.; Pisanko, Viktor N.; Melnikov, Oleg F.; and Klochkov, Evgeny I., 4,550,170, Cl. 548-154.000.
Plastics Engineering Company: *See—*
Korb, Louis L.; and Waitkus, Phillip A., 4,550,015, Cl. 423-445.000.
Plastics Industries, Inc.: *See—*
Giltnane, Robert, 4,549,711, Cl. 248-188.000.
Plattner, Jacob: *See—*
Voss, Houston F.; Plattner, Jacob; and Herrin, Thomas R., 4,550,163, Cl. 544-244.000.
Platz, Rolf; Kummer, Rudolf; Schneider, Heinz-Walter; and Schwirten, Kurt, to BASF Aktiengesellschaft. Manufacture of pent-3-enoic acid and its alkyl esters. 4,550,195, Cl. 560-206.000.
Plessey Overseas Limited: *See—*
Prince, Dennis; and Douglas, Eric C., 4,549,710, Cl. 248-183.000.
Plester, Karl-Heinz; Reddig, Klaus-Dieter; and Hessel, Heinz, to Gewerkschaft Eisenhutte Westfalia. Hydraulic ram. 4,549,469, Cl. 92-5.00R.
Pliefke, Engelbert, to Hoechst Aktiengesellschaft. Electrochemical developing process for reproduction layers. 4,549,944, Cl. 204-129.100.
Ploppa, Jurgen: *See—*
Stoll, Thomas; Ploppa, Jurgen; and Goller, Ernst, 4,549,412, Cl. 66-149.00R.
Plueddemann, Edwin P.: *See—*
Chandra, Grish; Kosal, Jeffrey A.; Petroff, Lenin J.; and Plueddemann, Edwin P., 4,549,979, Cl. 252-135.000.
Plummer, William T., to Polaroid Corporation. Method for forming a non-symmetrical optical fiber. 4,549,891, Cl. 65-3.120.
Plurichemie Anstalt: *See—*
Page, Philip R.; and Villax, Ivan, 4,550,096, Cl. 502-166.000.
Plus One Ltd.: *See—*
Coley, Charles R., 4,549,331, Cl. 24-92.000.
Plyakin, Nikolai P.: *See—*
Minenko, Leonid; Belikov, Evgeny V.; Bobryshev, Oleg V.; Klyatis, Lev M.; Mescheryakov, Ivan K.; Osipov, Viktor G.; Osher, Mikhail I.; and Plyakin, Nikolai P., 4,549,760, Cl. 294-88.000.
Pneumatic Scale Corporation: *See—*
Dee, Gerald M.; and Catrambone, Frank A., 4,549,620, Cl. 177-60.000.
Pocal Industries, Inc.: *See—*
Jensen, Jens C., 4,549,487, Cl. 102-498.000.
Poitevin, Jean-Pierre R. Test device, and method for locating faults in a two-lead line. 4,550,223, Cl. 179-175.30F.
Polan, Ned W.; Smialek, Raymond J.; and Parthasarathi, Arvind, to Olin Corporation. Systems for producing electroplated and/or treated metal foil. 4,549,950, Cl. 204-206.000.
Polan, Ned W.: *See—*
Parthasarathi, Arvind; and Polan, Ned W., 4,549,941, Cl. 204-27.000.
Polaroid Corporation: *See—*
Mehta, Avinash C., 4,550,214, Cl. 568-643.000.
Plummer, William T., 4,549,891, Cl. 65-3.120.
Viola, Michael S., 4,550,325, Cl. 346-140.00R.
Polova, Alfred, to South Africa Inventions Development Corporation. Manufacture and use of fowl egg antibodies. 4,550,019, Cl. 424-85.000.
Pommer, Ernst-Heinrich: *See—*
Ruland, Alfred; Reuther, Wolfgang; Pommer, Ernst-Heinrich; and Ammermann, Eberhard, 4,550,173, Cl. 548-262.000.
Ponsinet, Gerard: *See—*
Farge, Daniel; Leger, Andre ; and Ponsinet, Gerard, 4,550,110, Cl. 514-254.000.
Pont-A-Mousson S.A.: *See—*
Fuminier, Claude B., 4,549,678, Cl. 225-2.000.
Porter, John E.; and Ramshaw, Colin, to Imperial Chemical Industries PLC. Contacting device. 4,549,998, Cl. 261-88.000.
Posen, Boris J.: *See—*
Baker, Thomas R.; Hittenberger, William H.; and Posen, Boris J., 4,549,876, Cl. 493-169.000.
Post Technologies, Inc.: *See—*
Fish, Russell, III; and Yurchenco, James R., 4,549,825, Cl. 400-692.000.
Pouliot, Damien. Restraint for flexible conduits. 4,549,332, Cl. 24-335.000.
Powell, Dennis W.: *See—*
Moran, Daniel B.; Powell, Dennis W.; and Albright, Jay D., 4,550,166, Cl. 546-119.000.
Powers, Kerns H., to RCA Corporation. Compatible and hierarchical digital television system standard. 4,550,335, Cl. 358-11.000.
PPG Industries, Inc.: *See—*
Dowbenko, Rostyslaw; and Greigger, Barbara A., 4,550,137, Cl. 525-31.000.
Kenworthy, James S.; and Kozinski, Thomas G., 4,549,939, Cl. 204-4.000.
Makhlouf, Joseph M.; McCollum, Gregory J.; and Kerr, Paul R., 4,550,060, Cl. 428-423.100.
Prange, Rainer: *See—*
Wyskott, Bernd; Prange, Rainer; Moller, Kurt; and Fleischer, Joachim, 4,549,906, Cl. 106-16.000.
Prasad, Hari K.: *See—*
Federico, Anthony M.; Legg, Ernest L.; Wiiczek, Stephen P.; Prasad, Hari K.; and Petery, James J., 4,550,382, Cl. 364-572.000.
Pratt & Whitney Aircraft of Canada Limited: *See—*
Saintsbury, John A.; Sampath, Parthasarathy; and Weinberg, Maurice, 4,549,402, Cl. 60-738.000.
Prechner, Roland: *See—*
Morin, Daniel; and Prechner, Roland, 4,549,584, Cl. 141-73.000.
Precision Surgical Instruments, Inc.: *See—*
Caspari, Richard B.; Whipple, Terry L.; and Thimsen, James A., 4,549,540, Cl. 128-133.000.
Prein, Franz: *See—*
Karning, Heinrich; Prein, Franz; and Vierling, Karl-Heinz, 4,550,408, Cl. 372-58.000.
Prengaman, Richard J.; Thurber, Robert E.; Phipps, Joe; Greenberg, Ronald I.; Hom, Wai L.; Jaworski, James F.; and Riffle, Guy W., to Johns Hopkins University, The. Retrospective data filter. 4,550,318, Cl. 343-5.0PD.
Preussner, Theodor. Stranding device for stranding machines, particularly a pre-twist and drafting device. 4,549,394, Cl. 57-58.570.
Preziosi, Anthony F.: *See—*
Patel, Gordhanbhai N.; Preziosi, Anthony F.; Bhattacharjee, Himangshu R.; and Lee, Lester T. C., 4,550,150, Cl. 526-233.000.
Price, Alson K.: *See—*
Fanelli, Anthony J.; and Price, Alson K., 4,550,093, Cl. 502-107.000.
Price, Anthony G.; and Edwards, Roy E., to Lucas Industries public limited company. Disc brakes for vehicles. 4,549,636, Cl. 188-71.400.
Price, Fred D.; and Pierce, R. Neal, to Price, Fred D. Electrical socket cover. 4,549,778, Cl. 339-40.000.
Prichard, William W.: *See—*
Mabry, Melinda A.; Prichard, William W.; and Ziemecki, Stanislaw B., 4,550,185, Cl. 549-508.000.
Prince, Dennis; and Douglas, Eric C., to Plessey Overseas Limited. Supporting assembly. 4,549,710, Cl. 248-183.000.
Pritchard, Dalton H.: *See—*
Nicholson, Warren H.; and Pritchard, Dalton H., 4,550,340, Cl. 358-31.000.
Proctor, Timothy R.: *See—*
Cook, Kenneth D.; and Proctor, Timothy R., 4,549,570, Cl. 137-389.000.
Propster, Mark A.: *See—*
Streicher, William L.; and Propster, Mark A., 4,549,896, Cl. 65-135.000.
Protechna Herbst GmbH & Co. KG: *See—*
Flamig, Peter, 4,549,413, Cl. 66-163.000.
Pryor, James W., to R. J. Reynolds Tobacco Co. Manufacture of tobacco smoke filters. 4,549,875, Cl. 493-49.000.
Pulk, Brian E.; and Bateman, Charles D., to Sundstrand Data Control, Inc. Dynamic low tire pressure detection system for aircraft. 4,550,385, Cl. 364-558.000.
Purcell, Robert F.; and Hallock, Louis L. Cetane improver for diesel fuel. 4,549,883, Cl. 44-57.000.
Pustek, Frank J.: *See—*
Samuel, Raj K.; Kozlowski, Ronald J.; and Pustek, Frank J., 4,549,909, Cl. 127-33.000.
Putnik, Charles F.: *See—*
Peterson, Marvin L.; Putnik, Charles F.; and Maxson, Orwin G., 4,549,948, Cl. 204-196.000.

Putzar, Roland: *See*—
Karlen, Urs; Putzar, Roland; and Schaulin, Rudolf, 4,550,178, Cl. 548-426.000.

Quagliato, Dominick A.: *See*—
Anderson, Wayne K.; and Quagliato, Dominick A., 4,550,187, Cl. 556-137.000.

Quick, Leonard M.: *See*—
Hensley, Albert L., Jr.; and Quick, Leonard M., 4,549,957, Cl. 208-216.0PP.

Quignard, Francoise: *See*—
Basset, Jean M. M.; Leconte, Michel; Ollivier, Jean; and Quignard, Francoise, 4,550,216, Cl. 585-645.000.

R. J. Reynolds Tobacco Co.: *See*—
Pryor, James W., 4,549,875, Cl. 493-49.000.

Raab, Simon: *See*—
Fraser, Gregory A.; and Raab, Simon, 4,549,555, Cl. 128-782.000.

Rabe, James A.: *See*—
Lee, Chi-Long; Maxson, Myron T.; and Rabe, James A., 4,550,125, Cl. 521-117.000.

Racal Security Limited: *See*—
Galloway, John L.; Hankins, Timothy R. F.; and Owers, Ian A., 4,550,311, Cl. 340-531.000.
Galloway, John L.; and Hankins, Timothy R. F., 4,550,312, Cl. 340-539.000.

Radecca, Inc.: *See*—
Beall, Gary W., 4,549,966, Cl. 210-661.000.

Raiha, Antti P. Decapping tool. 4,549,463, Cl. 86-36.000.

Ramacciotti, Aldo: *See*—
Marino, Emilio; and Ramacciotti, Aldo, 4,549,677, Cl. 222-591.000.

Ramachandran, Venkataraman, to Ethyl Corporation. Preparation of 1-alkyl-1,4-dihydro-4-oxo-7-(4-pyridyl)-3-quinoline carboxylic acid. 4,550,167, Cl. 546-156.000.

Ramsey, Robert W., Jr., to Automation Industries, Inc. Method and apparatus for handling drums. 4,549,845, Cl. 414-620.000.

Ramshaw, Colin: *See*—
Porter, John E.; and Ramshaw, Colin, 4,549,998, Cl. 261-88.000.

Rapp, Helmut: *See*—
Schulz, Ralf-Thilo; and Rapp, Helmut, 4,549,726, Cl. 267-140.500.

Rask, Rodney B.: *See*—
Rush, William B., II; and Rask, Rodney B., 4,549,506, Cl. 123-52.0MB.

Rasmussen, Ib O.: *See*—
Jensen, Carl A.; and Rasmussen, Ib O., 4,549,963, Cl. 210-314.000.

Rau, Wolfgang: *See*—
Burk, Gerhard; and Rau, Wolfgang, 4,549,762, Cl. 296-208.000.

Raven, Cornelis W.: *See*—
Paerels, Gerard B.; and Raven, Cornelis W., 4,550,205, Cl. 564-166.000.

Raychem Corporation: *See*—
McTavish, Mary S.; Stodieck, Robert W.; and Doljack, Frank A., 4,550,301, Cl. 338-20.000.

RCA Corporation: *See*—
Corboy, John F., Jr.; Jastrzebski, Lubomir L.; Blackstone, Scott C.; and Pagliaro, Robert H., Jr., 4,549,926, Cl. 156-612.000.
Dischert, Robert A.; Moles, Warren H.; Rhodes, Roland N.; and Walter, James M., 4,550,337, Cl. 358-13.000.
Fling, Russell T., 4,550,339, Cl. 358-28.000.
Ganssle, Eugene R.; and Miller, Claude P., 4,550,319, Cl. 343-882.000.
Hamalainen, Kaarlo J., 4,550,351, Cl. 360-77.000.
Hayman, Julius, 4,550,435, Cl. 382-9.000.
Nicholson, Warren H.; and Pritchard, Dalton H., 4,550,340, Cl. 358-31.000.
Powers, Kerns H., 4,550,335, Cl. 358-11.000.
Sepp, Walter E., 4,550,336, Cl. 358-11.000.

Recordati S.A., Chemical & Pharmaceutical Company: *See*—
Nardi, Dante; Tajana, Alberto; Pennini, Renzo; Cazzulani, Pietro; Graziani, Gabriele; and Casadio, Silvano, 4,550,115, Cl. 514-320.000.

Reddig, Klaus-Dieter: *See*—
Plester, Karl-Heinz; Reddig, Klaus-Dieter; and Hessel, Heinz, 4,549,469, Cl. 92-5.00R.

Redicon Corporation: *See*—
Bulso, Joseph D., Jr.; Doyle, Stephen D.; and McClung, James A., 4,549,424, Cl. 72-329.000.

Redka, William: *See*—
Brighton, Carl T.; Black, Jonathan; and Redka, William, 4,549,547, Cl. 128-419.00F.

Reed, Antony S.: *See*—
Papp, John E.; and Reed, Antony S., 4,549,773, Cl. 308-3.800.

Reed, Martin A.: *See*—
Convis, Danny B.; Grimm, Paul J.; and Reed, Martin A., 4,550,438, Cl. 382-56.000.

Reed Tubular Products Company: *See*—
Saunders, Donna D.; Kalsi, Manmohan S.; and Chen, Gun-Shing, 4,549,754, Cl. 285-334.000.

Regel, Erik: *See*—
Kramer, Wolfgang; Buchel, Karl H.; Elbe, Hans-Ludwig; Kraatz, Udo; Regel, Erik; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Lurssen, Klaus, 4,549,900, Cl. 71-92.000.

Regie Nationale des Usines Renault: *See*—
Le Tiec, Patrick; and Lacroix, Marc, 4,549,646, Cl. 198-409.000.
Trintignac, Christian; and Jaccod, Jean-Claude, 4,549,468, Cl. 91-361.000.

REHAU Plastiks AG & Co.: *See*—
Burkel, Heinz, 4,550,009, Cl. 264-529.000.

Reichel, Curtis J.; and Hartman, Robert J., to BASF Wyandotte Corporation. Process for the preparation of polyether-ester polyols. 4,550,194, Cl. 560-200.000.

Reid, Neil G.: *See*—
Kaalstad, Oscar W.; and Reid, Neil G., 4,549,614, Cl. 175-339.000.

Reiersgaard, William L.: *See*—
Corbett, Scott S., Jr.; Perrott, Lynn F.; and Reiersgaard, William L., 4,549,663, Cl. 211-13.000.

Reiffer, Johannes: *See*—
Disteldorf, Josef; Hubel, Werner; and Reiffer, Johannes, 4,549,991, Cl. 260-453.0PH.

Reimer, William A., to GTE Automatic Electric Inc. Board positioning arrangement. 4,550,362, Cl. 361-415.000.

Reiner, Martin J.; and Fassler, Michael H., to United Technologies Corporation. Preventing mold and casting cracking in high rate directional solidification processes. 4,549,599, Cl. 164-122.100.

Reinersman, Dennis J.: *See*—
Alexander, Robert L.; Getoor, Richard C.; and Reinersman, Dennis J., 4,549,473, Cl. 98-67.000.

Reinherz, Ellis L.; Schlossman, Stuart F.; and Meuer, Stefan C., to Dana-Farber Cancer Institute, Inc. Monoclonal antibodies that recognize human T cells. 4,550,086, Cl. 436-506.000.

Remo, Inc.: *See*—
Hartry, Donald R.; and Belli, Remo D., 4,549,462, Cl. 84-413.000.

Renker, Hansjorg, to Fritz Studer AG. Composition and method for forming molded and cast machine parts. 4,550,127, Cl. 523-212.000.

Repa Feinstanzwerk GmbH: *See*—
Fohl, Arthur, 4,549,705, Cl. 242-107.40R.
Fohl, Artur, 4,549,704, Cl. 242-107.000.
Fohl, Artur, 4,549,768, Cl. 297-468.000.

Repetto, Silvio, to S.p.A. Luigi Rizzi & C. Machine for splitting skins, having an adjustable calibrating roller. 4,549,416, Cl. 69-10.000.

Republic Steel Corporation: *See*—
Smitley, Bruce B., 4,549,665, Cl. 211-191.000.

Research Foundation of State University of New York, The: *See*—
Anderson, Wayne K.; and Quagliato, Dominick A., 4,550,187, Cl. 556-137.000.

Reuther, Wolfgang: *See*—
Ruland, Alfred; Reuther, Wolfgang; Pommer, Ernst-Heinrich; and Ammermann, Eberhard, 4,550,173, Cl. 548-262.000.

Rhodes, Roland N.: *See*—
Dischert, Robert A.; Moles, Warren H.; Rhodes, Roland N.; and Walter, James M., 4,550,337, Cl. 358-13.000.

Rhone-Poulenc Sante: *See*—
Farge, Daniel; Leger, Andre ; and Ponsinet, Gerard, 4,550,110, Cl. 514-254.000.

Rhone-Poulenc Specialites Chimiques: *See*—
Boutin, Jean, 4,550,033, Cl. 427-222.000.

Rialan, Joseph: *See*—
Douaud, Andre ; and Rialan, Joseph, 4,549,513, Cl. 123-425.000.

Ricci, Marco: *See*—
Venturello, Carlo; and Ricci, Marco, 4,550,196, Cl. 562-418.000.

Richardson, Peter J., to Imperial Chemical Industries Limited. Method of preparing tetrahalobenzene compounds, chemical intermediates used therein and certain of the compounds themselves. 4,550,206, Cl. 564-289.000.

Rickey, Wynn P.: *See*—
Hibbs, David A.; Rickey, Wynn P.; and Stanton, Paul N., 4,549,578, Cl. 137-624.110.

Ricky Contact Lens Research Institute Inc.: *See*—
Suminoe, Taro; Ito, Tetsuo; Kiyomatsu, Yasuhiro; and Shimizu, Takao, 4,550,001, Cl. 264-2.600.

Rico, Ezequiel. Article receptacle. 4,550,440, Cl. 383-33.000.

Ricoh Company, Ltd.: *See*—
Inokuchi, Toshiyuki, 4,549,784, Cl. 350-96.270.
Sato, Tsutomu; and Horike, Masanori, 4,550,321, Cl. 346-75.000.

Ridder, Robert A.; and Tramontana, Joseph C., to Xerox Corporation. Light emitting semiconductor mount. 4,550,333, Cl. 357-81.000.

Riegel, Hans: *See*—
Fey, Michael; Finkelstein, Wolfgang; Haaz, Josef; and Riegel, Hans, 4,549,474, Cl. 98-120.000.

Rieter-Scragg Limited: *See*—
Brough, Denys W.; and Lawrence, Christopher J., 4,549,361, Cl. 34-17.000.

Riffle, Guy W.: *See*—
Prengaman, Richard J.; Thurber, Robert E.; Phipps, Joe; Greenberg, Ronald I.; Hom, Wai L.; Jaworski, James F.; and Riffle, Guy W., 4,550,318, Cl. 343-5.0PD.

Riley, Brian: *See*—
Alexander, M. Grayson; and Riley, Brian, 4,550,066, Cl. 429-191.000.

Rimsa, Stephen B.; Harris, James E.; Chao, Herbert S.; and Maresca, Louis M., to Union Carbide Corporation. Circuit board substrates prepared from poly(aryl ethers)s. 4,550,140, Cl. 525-132.000.

Rinkewich, Isaac. Double-wall container. 4,549,672, Cl. 220-441.000.

Ristvedt-Johnson, Inc.: *See*—
Johnson, Roy B., deceased; and Ristvedt, Victor G., 4,549,561, Cl. 133-3.00A.

Ristvedt, Victor G.: *See*—
Johnson, Roy B., deceased; and Ristvedt, Victor G., 4,549,561, Cl. 133-3.00A.

Ritschel, Peter; Freudenreich, Herbert; and Hartmann, Waldemar, to USM Corporation. Method and apparatus for providing foaming thermoplastic compositions. 4,549,915, Cl. 156-78.000.

Rivera, Glenn. Lock for cycles. 4,549,417, Cl. 70-18.000.

Roach, Robert E.: *See—*
Huffhines, Donald F.; and Roach, Robert E., 4,549,499, Cl. 114-244.000.
Robert Bosch GmbH: *See—*
Dobler, Klaus; Heinz, Rudolf; Schoor, Ulrich; and Frey, Thomas, 4,549,430, Cl. 73-115.000.
Gneiss, Heinz; Sumal, Jaihind S.; and Wunsch, Werner, 4,549,433, Cl. 73-204.000.
Grieshaber, Hermann; and Siebert, Hans-Joachim, 4,549,511, Cl. 123-263.000.
Horbelt, Michael; Schnurle, Hans; Strauss, Peter; and Werner, Peter, 4,549,519, Cl. 123-493.000.
Maisch, Wolfgang, 4,549,515, Cl. 123-452.000.
RobertShaw Controls Company: *See—*
Kelly, Samuel T., 4,549,571, Cl. 137-489.500.
Robinson, Alfred: *See—*
Kot, Vincent; Wallis, Bruce; and Robinson, Alfred, 4,549,755, Cl. 285-341.000.
Rockwell International Corporation: *See—*
Barkhoudarian, Sarkis, 4,549,436, Cl. 73-517.00A.
Milano, Raymond A., 4,550,331, Cl. 357-24.000.
Roder, Albert; Seidel, Hans; and Giffhorn, Friedrich, to Boehringer Mannheim GmbH. Determination of L(+)-tartrate or D(+)-malate with L(+)-tartrate dehydrogenase. 4,550,079, Cl. 435-189.000.
Roehrs, Robert E.: *See—*
Garabedian, Michael E.; and Roehrs, Robert E., 4,550,022, Cl. 424-127.000.
Roettele, Donald L.: *See—*
Hoy, Walter S.; and Roettele, Donald L., 4,549,379, Cl. 52-200.000.
Rogers, Richard B.; and Gerwick, B. Clifford, III, to Dow Chemical Company, The. Fluorophenoxyphenoxypropionates and derivatives thereof. 4,550,192, Cl. 560-62.000.
Rogers, Russell L., to Aeroquip Corporation. Breakaway fluid system. 4,549,575, Cl. 137-614.030.
Rogers, Russell L.: *See—*
Fournier, Paul J. E.; and Rogers, Russell L., 4,549,440, Cl. 73-863.850.
Rohm GmbH: *See—*
Hosch, Ludwig, 4,550,136, Cl. 524-718.000.
Rohm and Haas Company: *See—*
Gerhold, Norman R., 4,549,903, Cl. 71-116.000.
Rohrer, Heinrich: *See—*
Binnig, Gerd K.; Feenstra, Randall M.; Hodgson, Rodney T.; Rohrer, Heinrich; and Woodall, Jerry M., 4,550,257, Cl. 250-492.200.
Rokutanda, Takashi; and Nakamura, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus and method for processing macroinstructions and microinstructions. 4,550,369, Cl. 364-200.000.
Romanov, Nikolai N.: *See—*
Gjulling, Eduard V.; Djugovskaya, Larisa A.; Zabolotny, Dmitry I.; Kovtun, Jury P.; Liptuga, Nikolai I.; Litus, Viktor I.; Sambur, Marina B.; Romanov, Nikolai N.; Tolmachev, Alexei I.; Kirsanov, Alexandr V.; Pisanko, Viktor N.; Melnikov, Oleg F.; and Klochkov, Evgeny I., 4,550,170, Cl. 548-154.000.
Rosanes, A., to Hazeltine Corporation. Digital transmitter. 4,550,416, Cl. 375-59.000.
Rose, Floyd D. Apparatus for restraining and fine tuning the strings of a musical instrument, particularly guitars. 4,549,461, Cl. 84-313.000.
Rosemount Inc.: *See—*
Stickney, Truman M., 4,549,706, Cl. 244-1.00R.
Rosenberg, Isadore; and Amsite, William K., to Figgie International, Inc. Ballistic resistant armor panel and method of constructing the same. 4,550,044, Cl. 428-101.000.
Rosenberg, James J.: *See—*
Jackson, Thomas N.; Kirchner, Peter D.; Pettit, George D.; Rosenberg, James J.; Woodall, Jerry M.; and Wright, Steven L., 4,550,047, Cl. 428-136.000.
Rosenburg, Charles W., to F. N. Burt Company, Inc. Collapsible bottom structure for eight-sided container. 4,549,690, Cl. 229-41.00C.
Rosenfeld, Michael G.: *See—*
Evans, Ronald M.; and Rosenfeld, Michael G., 4,549,986, Cl. 260-112.50T.
Rosenthal, Johannes: *See—*
Auer, Eberhard; Gehrmann, Klaus; Ohorodnik, Alexander; and Rosenthal, Johannes, 4,549,995, Cl. 260-973.000.
Roshdy, Constance E., to Ethicon, Inc. Unitary armed suture mounting board. 4,549,649, Cl. 206-63.300.
Ross, Donald R., Sr., to U-S Safety Trolley Corp. Trolley rail. 4,550,231, Cl. 191-23.00A.
Ross, William E.: *See—*
Cox, David L.; Ross, William E.; and Toche, Calvin A., 4,550,389, Cl. 365-37.000.
Rothman, Ulf S. E. Polypeptide fractions from mussel for medical use. 4,550,020, Cl. 424-88.000.
Rotring-Werke Riepe KG: *See—*
Anderka, Gerold; and Tenhagen, Rolf, 4,549,828, Cl. 401-258.000.
Roux, Jacques: *See—*
Foch, Henri; and Roux, Jacques, 4,550,365, Cl. 363-98.000.
Roy, Stephen C.: *See—*
Zagorski, Joseph B.; and Roy, Stephen C., 4,549,534, Cl. 128-25.00R.
Rozario, Novellone; and Silverman, Lawrence H., to General Instrument Corp. Driver for voltage controlled attenuator. 4,550,265, Cl. 307-494.000.
Rozporka, Richard E., to Tandy Corporation. Latch for video cassette container. 4,549,669, Cl. 220-306.000.
RTE Corporation: *See—*
Mikulecky, Harvey W., 4,550,298, Cl. 335-35.000.
Rubbermaid Commercial Products Inc.: *See—*
Hampshire, James F.; and Wilkinson, Beverly L., 4,549,767, Cl. 297-439.000.
Rudolph, Ronald M.: *See—*
Hense, Thomas R.; and Rudolph, Ronald M., 4,549,359, Cl. 33-516.000.
Rudzit, Ernest A.: *See—*
Lavretskaya, Elionora F.; Rudzit, Ernest A.; Piruzian, Lev A.; Volkova, Ljubov I.; Zakharova, Nina I.; Sarkisian, David A.; Upadysheva, Alexandra V.; Grigorieva, Natalya D.; Znamenskaya, Anna P.; Libinzon, Rakhil E.; and Antonian, Semen G., 4,550,113, Cl. 514-290.000.
Ruland, Alfred; Reuther, Wolfgang; Pommer, Ernst-Heinrich; and Ammermann, Eberhard, to BASF Aktiengesellschaft. Ditriazolylvinyl phenyl ketones. 4,550,173, Cl. 548-262.000.
Rumpp, Gerhard; and Scholz, Dieter, to Hilti Aktiengesellschaft. Rock drill. 4,549,616, Cl. 175-394.000.
Rush, William B., II; and Rask, Rodney B., to General Motors Corporation. Engine intake system with modulated tuning. 4,549,506, Cl. 123-52.0MB.
Russell, William C. Insulator for bottled beverages. 4,549,410, Cl. 62-457.000.
Ryobi Ltd.: *See—*
Hakoda, Kouzou, 4,549,371, Cl. 51-170.0MT.
Ryon, Ward E.: *See—*
David, John C.; and Ryon, Ward E., 4,550,122, Cl. 172-158.000.
S. A. Martin: *See—*
Berthelot, Daniel; and Girerd, Jean-Paul, 4,549,924, Cl. 156-470.000.
Saarbergwerke Aktiengesellschaft: *See—*
Spliethoff, Heinz, 4,549,401, Cl. 60-652.000.
Sacca, Demetrio B.; and Hoffman, Donald E., to General Motors Corporation. Single inlet/outlet-tank U-shaped tube heat exchanger. 4,549,605, Cl. 165-150.000.
Sachdev, Krishna G.; and Aviram, Ari, to International Business Machines Corporation. Ink additives for efficient thermal ink transfer printing processes. 4,549,824, Cl. 400-241.100.
Sachdev, Krishna G.; Shear, Stephen A.; Pennington, Keith S.; and Cohen, Mitchell S., to International Business Machines Corporation. Electroerosion printing media using depolymerizable polymer coatings. 4,550,061, Cl. 428-461.000.
Sadamitsu, Kazuo: *See—*
Unno, Yohei; Ueno, Satoru; Sadamitsu, Kazuo; and Okamoto, Tsuneo, 4,549,581, Cl. 138-109.000.
Sahagian, Edward H. Resilient wheels. 4,549,590, Cl. 152-41.000.
Sahara, Teruyoshi: *See—*
Endo, Mitsushi; Taniguchi, Toshiaki; Sahara, Teruyoshi; Hayakawa, Noriyuki; Yoshitomi, Tatsuo; Takahashi, Kozo; Nagatani, Yoshiteru; Kawai, Hidenao; Kaizyo, Shuichi; Nakagawa, Yoichi; Yamagami, Kazuo; Takizawa, Teruo; and Suzuki, Tomio, 4,549,472, Cl. 98-34.600.
St. Clair, Joseph V. Portable wet and dry self-cleaning vacuum device. 4,549,329, Cl. 15-353.000.
St. Regis Paper Company: *See—*
Keppel, Stephen C., 4,550,441, Cl. 383-103.000.
Saintsbury, John A.; Sampath, Parthasarathy; and Weinberg, Maurice, to Pratt & Whitney Aircraft of Canada Limited. Combustor for a gas turbine engine. 4,549,402, Cl. 60-738.000.
Saito, Keiji: *See—*
Matsumiya, Saburo; Uehara, Katsuya; Saito, Keiji; Michiki, Hideyuki; and Yaginuma, Kenichi, 4,549,904, Cl. 75-7.000.
Saito, Takao: *See—*
Moriyama, Masakazu; and Saito, Takao, 4,550,317, Cl. 340-995.000.
Saitta, Joseph P. System for signalling conditions of, including an emergency within, a vehicle. 4,550,304, Cl. 340-84.000.
Sakai, Yoshio: *See—*
Nagasawa, Kouichi; Ikeda, Shuji; Suzuki, Norio; and Sakai, Yoshio, 4,549,340, Cl. 29-571.000.
Sakakibara, Shiro, to Aisin Warner Kabushiki Kaisha. Belt drive continuously-variable speed automatic transmission. 4,549,447, Cl. 74-689.000.
Sakamoto, Katsuji: *See—*
Toda, Yuichi; Sakamoto, Katsuji; Tanaka, Shigeru; and Kameo, Yuji, 4,549,391, Cl. 57-13.000.
Sakane, Kazuo: *See—*
Teraji, Tsutomu; Sakane, Kazuo; and Goto, Jiro, 4,550,102, Cl. 514-206.000.
Sakata, Norihiko; and Miura, Nobuo, to Asahi Kasei Kogyo Kabushiki Kaisha. Vinylidene chloride type resin expandable particles, foam particles, in-mold foam molding by use thereof and process for producing them. 4,550,003, Cl. 264-53.000.
Sakurai, Masaki: *See—*
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; and Yoshihara, Kenji, 4,550,393, Cl. 369-32.000.
Salk Institute for Biological Studies, The: *See—*
Evans, Ronald M.; and Rosenfeld, Michael G., 4,549,986, Cl. 260-112.50T.
Salyer, Alan. Weight type exercising device. 4,549,733, Cl. 272-118.000.
Sambur, Marina B.: *See—*
Gjulling, Eduard V.; Djugovskaya, Larisa A.; Zabolotny, Dmitry I.; Kovtun, Jury P.; Liptuga, Nikolai I.; Litus, Viktor I.; Sambur, Marina B.; Romanov, Nikolai N.; Tolmachev, Alexei I.; Kirsanov, Alexandr V.; Pisanko, Viktor N.; Melnikov, Oleg F.; and Klochkov, Evgeny I., 4,550,170, Cl. 548-154.000.

Sampath, Parthasarathy: *See*—
Saintsbury, John A.; Sampath, Parthasarathy; and Weinberg, Maurice, 4,549,402, Cl. 60-738.000.

Samuel, Raj K.; Kozlowski, Ronald J.; and Pustek, Frank J., to American Maize-Products Company. Dextrinized waxy starch of excellent clarity and luster in aqueous solution and process of manufacture. 4,549,909, Cl. 127-33.000.

Sanchez, Joseph P.: *See*—
Mich, Thomas F.; and Sanchez, Joseph P., 4,550,104, Cl. 514-210.000.

Sandell, Sven. Candle simulating light bulb cover. 4,550,363, Cl. 362-806.000.

Sander, Bernard T., Jr.: *See*—
Chodrow, Mark M.; Sander, Bernard T., Jr.; Sharpless, Charles H.; and Theriot, Eugene J., 4,550,404, Cl. 370-110.100.

Sanders Associates, Inc.: *See*—
Smades, Jack E., 4,549,918, Cl. 156-160.000.

Sanderson, John R.: *See*—
Yeakey, Ernest L.; and Sanderson, John R., 4,550,184, Cl. 549-453.000.

Sandoz Ltd.: *See*—
Doswald, Paul; Moriconi, Emil; Moser, Helmut; and Schmid, Horst, 4,550,158, Cl. 534-605.000.

Sands, Charles D.: *See*—
Gowan, Norman H.; Petravicius, Stasys; Hernandez, Ignacio T.; Kuhlmann, Robert E.; Vande Walle, Donald R., Jr.; Weddell, Ronald P.; Gates, Joseph M.; Sitzwohl, Kenneth J.; Sands, Charles D.; Gwinn, Rick A.; and Peterman, Milton J., 4,549,664, Cl. 211-131.000.

Sanki Engineering Co., Ltd.: *See*—
Nunogaki, Yoshiaki; Kobayashi, Tetsuya; and Kosuge, Yasutaka, 4,550,417, Cl. 377-10.000.

Sankyo Manufacturing Company, Ltd.: *See*—
Kato, Heizaburo, 4,549,683, Cl. 226-142.000.

Sanpei, Tohru: *See*—
Wakabayashi, Manabu; Minami, Kihachiro; Sanpei, Tohru; and Konno, Kazutoshi, 4,550,354, Cl. 360-133.000.

Sanshin Kogyo Kabushiki Kaisha: *See*—
Fujimoto, Hiroaki, 4,549,508, Cl. 123-73.0PP.
Iida, Kazumi; and Ikeda, Kenji, 4,549,869, Cl. 440-84.000.

Santalucia, Andre : *See*—
Billard, Alain; Calmettes, Hubert; and Santalucia, Andre 4,549,489, Cl. 102-505.000.

Sapre, Ajit V.: *See*—
Graziani, Kenneth R.; and Sapre, Ajit V., 4,550,217, Cl. 585-324.000.

Sargent, Colin R.; Brierley, Keith; Wotton, David E. M.; and Coe, Paul L., to I.S.C. Chemicals Limited. Vapor phase soldering using perfluorotetradecahydrophenanthrene ($C_{14}F_{24}$). 4,549,686, Cl. 228-242.000.

Sarkisian, David A.: *See*—
Lavretskaya, Elionora F.; Rudzit, Ernest A.; Piruzian, Lev A.; Volkova, Ljubov I.; Zakharova, Nina I.; Sarkisian, David A.; Upadysheva, Alexandra V.; Grigorieva, Natalya D.; Znamenskaya, Anna P.; Libinzon, Rakhil E.; and Antonian, Semen G., 4,550,113, Cl. 514-290.000.

Sasaki, Isao: *See*—
Kishida, Kazuo; Sasaki, Isao; Mori, Hiroshi; and Ii, Yasuaki, 4,550,130, Cl. 523-436.000.

Sasaki, Itsuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Switched capacitor integrator. 4,550,295, Cl. 333-19.000.

Sasaki, Junichi: *See*—
Toyama, Fumiyasu; Murakoshi, Masaaki; Wakuda, Masanori; Sasaki, Junichi; Watanabe, Hirotoshi; Yukawa, Tomio; and Okayama, Yoshihiko, 4,550,366, Cl. 364-136.000.

Satake, Keigo: *See*—
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizu, Susumu; Watanabe, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,549,902, Cl. 71-90.000.

Sato, Akihiko: *See*—
Fujiwara, Hidetoshi; and Sato, Akihiko, 4,549,566, Cl. 137-117.000.

Sato, Akihiro: *See*—
Chiba, Hiromasa; Kumahara, Katsumi; Harada, Takakiyo; Oka, Takahiro; and Sato, Akihiro, 4,550,144, Cl. 525-247.000.

Sato, Makoto; and Hiramoto, Kazuyuki, to Makino Milling Machine Co., Ltd. Machining system with operating mode selectors provided in machine controller of each NC machine tool. 4,550,375, Cl. 364-474.000.

Sato, Tsutomu; and Horike, Masanori, to Ricoh Company, Ltd. Charged ink-printer droplet detection. 4,550,321, Cl. 346-75.000.

Sato, Yoshiyuki; and Isozaki, Akio, to Kabushiki Kaisha Kobe Seiko Sho. Heat transfer pipe. 4,549,606, Cl. 165-179.000.

Sato, Yutaka: *See*—
Gonda, Michihiro; Kitsukawa, Katsumasa; Suzuka, Susumu; Kanasugi, Mikiko; Sato, Yutaka; and Otomo, Kikuo, 4,550,329, Cl. 346-214.000.

Satoh, Hosaku: *See*—
Ayusawa, Kazutoshi; Satoh, Hosaku; and Kazama, Munetada, 4,550,089, Cl. 501-139.000.

Satsuki, Teruhisa; and Ota, Seiiti, to Lion Corporation. Liquid detergent composition. 4,549,984, Cl. 252-532.000.

Sauer, Don R.: *See*—
Cheng, Fred T. J.; and Sauer, Don R., 4,550,424, Cl. 381-15.000.

Sauer, Joan K., legal representative: *See*—
Sauer, Ronald H., deceased; and Beedlow, Peter A., 4,549,355, Cl. 33-148.00H.

Sauer, Ronald H., deceased (by Sauer, Joan K., legal representative); and Beedlow, Peter A., to Battelle Memorial Institute. Electronic dendrometer. 4,549,355, Cl. 33-148.00H.

Saunders, Donna D.; Kalsi, Manmohan S.; and Chen, Gun-Shing, to Reed Tubular Products Company. Tool joint. 4,549,754, Cl. 285-334.000.

Sauvageau, Donald R.: *See*—
Hawkins, David K.; and Sauvageau, Donald R., 4,549,464, Cl. 89-1.809.

Savage, William S.: *See*—
Anderson, Gordon K.; and Savage, William S., 4,549,405, Cl. 62-239.000.

Savignac, Germain. Heat exchanger for stoves and fire-places. 4,549,522, Cl. 126-72.000.

Sawa, Tsutomu: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Naganawa, Hiroshi; Sawa, Tsutomu; Uchida, Takeshi; and Imoto, Masaya, 4,550,159, Cl. 536-6.400.

Sawada, Akashi: *See*—
Hayafuji, Yoshinori; Sawada, Akashi; Usui, Setsuo; and Shibata, Akikazu, 4,549,913, Cl. 148-33.000.

Sawano, Yukio; and Ono, Masaru, to Fuji Photo Film Co., Ltd. Method and apparatus for positioning microfiche card. 4,549,797, Cl. 353-27.00A.

Scandinavian Farming Aktiebolag: *See*—
Werling, Kenneth H., 4,549,660, Cl. 209-44.300.

Schadrack, William C., III; McQueen, Robert W.; and Eyerly, Joyce K., to Zimmer, Inc. Pin inserter sheath. 4,549,538, Cl. 128-92.0EB.

Schafer, Fritz: *See*—
Karrenbauer, Michael; Kleemann, Axel; Lussling, Theodor; and Schafer, Fritz, 4,550,199, Cl. 562-556.000.
Karrenbauer, Michael; Kleemann, Axel; Lussling, Theodor; and Schafer, Fritz, 4,550,200, Cl. 562-556.000.

Schafer, Helmut: *See*—
Huckler, Volker; Sonns, Eugen; Schafer, Helmut; and Nobis, Dieter, 4,549,637, Cl. 192-3.630.

Schaulin, Rudolf: *See*—
Karlen, Urs; Putzar, Roland; and Schaulin, Rudolf, 4,550,178, Cl. 548-426.000.

Schering Aktiengesellschaft: *See*—
Hofmeister, Helmut; Schulze, Paul E.; Annen, Klaus; Laurent, Henry; and Wiechert, Rudolf, 4,550,100, Cl. 514-179.000.

Schering Corporation: *See*—
Loshaek, Samuel; and Townsley, Malcolm G., 4,549,794, Cl. 351-161.000.

Schiffner, Robert E.; and Montgomery, Susan R. Mixing bowl splatter guard. 4,549,811, Cl. 366-129.000.

Schindler, Michael D., to Spacesaver Corporation. Library shelf support system. 4,549,777, Cl. 312-198.000.

Schlags, William I.: *See*—
Becker, William A.; Marlow, Richard A.; and Schlags, William I., 4,550,038, Cl. 428-12.000.

Schlossman, Stuart F.: *See*—
Reinherz, Ellis L.; Schlossman, Stuart F.; and Meuer, Stefan C., 4,550,086, Cl. 436-506.000.

Schlup, John R.: *See*—
Adamowicz, John A.; Schlup, John R.; and Spotz, Mark S., 4,549,931, Cl. 162-145.000.

Schmachtenberg, Richard, III, to Tektronix, Inc. Connector for optically connecting an electrically-energizable light source to an optical fiber. 4,549,783, Cl. 350-96.200.

Schmid, Horst: *See*—
Doswald, Paul; Moriconi, Emil; Moser, Helmut; and Schmid, Horst, 4,550,158, Cl. 534-605.000.

Schmidt, Gunther: *See*—
Engel, Wolfhard; Trummlitz, Gunter; Eberlein, Wolfgang; Mihm, Gerhard; Schmidt, Gunther; Hammer, Rudolf; and Giachetti, Antonio, 4,550,107, Cl. 514-220.000.

Schmidt, Leon W.: *See*—
Nelson, Larry A.; and Schmidt, Leon W., 4,550,084, Cl. 436-45.000.

Schmidt, Robert R.: *See*—
Forster, Heinz; Klauke, Erich; Eue, Ludwig; Schmidt, Robert R.; and Lurssen, Klaus, 4,549,899, Cl. 71-90.000.

Schmiedel, Manfred: *See*—
Von Gentzkow, Wolfgang; Schmiedel, Manfred; and Tussing, Reinhold, 4,550,204, Cl. 564-134.000.

Schmitt, Steven F.: *See*—
Altherr, Russell G.; and Schmitt, Steven F., 4,549,666, Cl. 213-62.00A.

Schmutz, Paul; and Angliker, Hans-Jorg, to Ciba-Geigy AG. Process for the preparation of monoaminoanthraquinones. 4,549,989, Cl. 260-378.000.

Schneider, Claus; Walther, Gerhard; Weber, Karl-Heinz; Bechtel, Wolf D.; and Boke-Kuhn, Karin, to Boehringer Ingelheim KG. 4-Phenyl-4,5,6,7-tetrahydro-thieno[2,3-c]pyridines and salts thereof, compositions and use. 4,550,106, Cl. 514-212.000.

Schneider, Heinz-Walter: *See*—
Platz, Rolf; Kummer, Rudolf; Schneider, Heinz-Walter; and Schwirten, Kurt, 4,550,195, Cl. 560-206.000.

Schnurle, Hans: *See*—
Horbelt, Michael; Schnurle, Hans; Strauss, Peter; and Werner, Peter, 4,549,519, Cl. 123-493.000.

Schoberth, Hans. Method and flour for producing sliceable bread with a high bran content. 4,550,023, Cl. 426-19.000.
Schoen, Uwe; Hachmeister, Bernd; Kehrbach, Wolfgang; Kuehl, Ulrich; and Buschmann, Gerd, to Kali-Chemie Pharma GmbH. 3,7-Diazabicyclo(3,3,1)nonane compounds and their use in treating heart disease. 4,550,112, Cl. 514-278.000.
Schoenig, Frederick C., Jr.; Landry, J. David; Walker, Edward S.; and Lai, Ching C., to General Electric Company. Transport apparatus. 4,549,662, Cl. 209-539.000.
Scholz, Dieter: *See*—
Rumpp, Gerhard; and Scholz, Dieter, 4,549,616, Cl. 175-394.000.
Schoor, Ulrich: *See*—
Dobler, Klaus; Heinz, Rudolf; Schoor, Ulrich; and Frey, Thomas, 4,549,430, Cl. 73-115.000.
Schroder, Dieter, to Paul Vom Stein & Co. Roller for moving equipment, furniture or the like. 4,549,592, Cl. 152-328.000.
Schuette, Scott D.: *See*—
Mueller, Wayne A.; and Schuette, Scott D., 4,550,250, Cl. 250-203.00R.
Schulz, Ralf-Thilo; and Rapp, Helmut, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Mounting member for mounting an engine or transmission of a motor vehicle. 4,549,726, Cl. 267-140.500.
Schulze, Paul E.: *See*—
Hofmeister, Helmut; Schulze, Paul E.; Annen, Klaus; Laurent, Henry; and Wiechert, Rudolf, 4,550,100, Cl. 514-179.000.
Schumacher, Richard T.: *See*—
Zitelli, Louis T.; and Schumacher, Richard T., 4,550,251, Cl. 250-213.0VT.
Schundehutte, Karl Heinz: *See*—
Stephan, Gunter; and Schundehutte, Karl Heinz, 4,550,207, Cl. 564-311.000.
Schuster, James E.: *See*—
Meyer, Dennis F.; and Schuster, James E., 4,549,498, Cl. 114-145.00A.
Schwab, Alfred: *See*—
Suh, John T.; Skiles, Jerry W.; Williams, Bruce E.; and Schwab, Alfred, 4,549,992, Cl. 260-455.00R.
Schwartz, Harold: *See*—
Katz, Philip; Brenman, Henry S.; Lowry, Louis D.; and Schwartz, Harold, 4,550,427, Cl. 381-70.000.
Schweitzer, Edmund O., Jr. Voltage loss sensor and alarm. 4,550,288, Cl. 324-133.000.
Schwirten, Kurt: *See*—
Platz, Rolf; Kummer, Rudolf; Schneider, Heinz-Walter; and Schwirten, Kurt, 4,550,195, Cl. 560-206.000.
Scott, William B.; and Ahmer, Bruce E., to W. A. Whitney Corp. Metal melting tool with improved stand-off means. 4,550,241, Cl. 219-121.0LG.
Sears, James T., to Ball Corporation. Thrust vector control actuator. 4,549,695, Cl. 239-265.350.
Security Shutter Corp.: *See*—
Forquer, William F., 4,549,444, Cl. 74-411.500.
Seger, Fritz O., to Smith International, Inc. Low noise valve. 4,549,718, Cl. 251-121.000.
Seguin, Marie-Christine; and Gueyne, Jean, to Societe dite: Exsymol S.A.M. Manufacture of non-saponifiable compounds from natural substances and the resulting products. 4,549,990, Cl. 260-397.250.
Seidel, Hans: *See*—
Roder, Albert; Seidel, Hans; and Giffhorn, Friedrich, 4,550,079, Cl. 435-189.000.
Seikosha Co., Ltd.: *See*—
Ikeda, Yoshiaki, 4,550,260, Cl. 307-106.000.
Seitz, Georg: *See*—
Fischer, Wolfgang; Seitz, Georg; and Krenn, Karl-Dieter, 4,550,083, Cl. 436-42.000.
Sekino, Syoichi, to Hitachi Construction Machinery Co., Ltd. Operation system for hoisting device. 4,549,640, Cl. 192-0.094.
Selflevel Covers (Jersey) Limited: *See*—
Ferns, Derek, 4,549,833, Cl. 404-4.000.
Sembrowich, Walter L.: *See*—
Knudson, Mark B.; Sembrowich, Walter L.; and Guruswamy, Vinodhini, 4,549,951, Cl. 204-416.000.
Semiconductor Energy Laboratory Co., Ltd.: *See*—
Yamazaki, Shunpei, 4,549,889, Cl. 62-11.000.
Seng, Yeoh C.; and Fong, Chen S., to Petroliam Nasional Berhad. Protein degraded pre-vulcanized natural rubber coated slow release fertilizers. 4,549,897, Cl. 71-3.000.
Senmed, Inc.: *See*—
Favaron, James A., 4,549,544, Cl. 128-335.000.
SenTech Medical Corporation: *See*—
Knudson, Mark B.; Sembrowich, Walter L.; and Guruswamy, Vinodhini, 4,549,951, Cl. 204-416.000.
Sepp, Walter E., to RCA Corporation. Progressive scan speed-up processor. 4,550,336, Cl. 358-11.000.
Serta-Societe d'Etudes et de Realisations des Techniques d'Automatisme: *See*—
Bourgeois, Jacques, 4,549,863, Cl. 425-126.00R.
Servo-Tek Products Company: *See*—
Leach, Robert L.; and Wickens, Richard L., 4,550,283, Cl. 322-48.000.
Sexton, John S.; Stone, Brian J.; Howes, Trevor D.; and Andrew, Colin, to De Beers Industrial Diamond Division (Proprietary) Limited. Grinding wheel. 4,549,372, Cl. 51-206.00R.
Seyer, Brenda J.: *See*—
Seyer, Jerome J.; and Seyer, Brenda J., 4,549,737, Cl. 273-118.00R.
Seyer, Jerome J.; and Seyer, Brenda J. Pool-type marble game. 4,549,737, Cl. 273-118.00R.
Seyler, Peter G., to Perfection Spring & Stamping Corp. Method of making internal nut for adjusting the tension of a coil spring. 4,549,325, Cl. 10-86.00R.
Sfikas, Nicholas. Mini disk holder. 4,549,658, Cl. 206-614.000.
Shah, Ashwin V.: *See*—
Bass, Leland J.; Shah, Ashwin V.; and Wickwire, Ralph O., 4,550,315, Cl. 340-703.000.
Shaklee, Kerry L.: *See*—
Whetstone, Albert L.; and Shaklee, Kerry L., 4,550,316, Cl. 340-710.000.
Sharp, Bernard C., to Parker-Hannifin Corporation. Rear view mirror with reinforced ear member. 4,549,791, Cl. 350-632.000.
Sharp Kabushiki Kaisha: *See*—
Furukawa, Toshio, 4,549,549, Cl. 128-680.000.
Sharpless, Charles H.: *See*—
Chodrow, Mark M.; Sander, Bernard T., Jr.; Sharpless, Charles H.; and Theriot, Eugene J., 4,550,404, Cl. 370-110.100.
Shaw, William S. Power transformer for use with very high speed integrated circuits. 4,550,364, Cl. 363-24.000.
Shear, Stephen A.: *See*—
Sachdev, Krishna G.; Shear, Stephen A.; Pennington, Keith S.; and Cohen, Mitchell S., 4,550,061, Cl. 428-461.000.
Shell Oil Company: *See*—
Bentham, Jeremy B., 4,550,000, Cl. 261-114.00R.
Hemphill, Dean P.; and Phifer, Edward H., 4,549,836, Cl. 405-61.000.
Pilgram, Kurt H.; and Skiles, Richard D., 4,550,121, Cl. 514-469.000.
Shelton, C. Byron, Jr.: *See*—
Abend, Robert J.; and Shelton, C. Byron, Jr., 4,549,338, Cl. 29-569.00L.
Shen, David H.: *See*—
Yen, Shiao-Ping S.; Carter, Boyd J.; Shen, David H.; and Somoano, Robert B., 4,550,064, Cl. 429-94.000.
Sheppard Douglas P., to Mostek Corporation. Method of making MOS read only memory by specified double implantation. 4,549,336, Cl. 29-576.00B.
Sherman, Richard H.: *See*—
Gable, Melvin G.; Sherman, Richard H.; and Yuan, Fumin, 4,550,402, Cl. 370-85.000.
Shibata, Akikazu: *See*—
Hayafuji, Yoshinori; Sawada, Akashi; Usui, Setsuo; and Shibata, Akikazu, 4,549,913, Cl. 148-33.000.
Shibata, Akira: *See*—
Terada, Toshimichi; Kuroyanagi, Tomomitsu; Kozima, Noboru; and Shibata, Akira, 4,550,345, Cl. 358-323.000.
Shibuya, Tsunenori: *See*—
Ishizuka, Yutaka; and Shibuya, Tsunenori, 4,549,855, Cl. 417-270.000.
Shida, Takafumi: *See*—
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizu, Susumu; Watanabe, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,549,902, Cl. 71-90.000.
Shih, Stuart S., to Mobil Oil Corporation. Process for stabilizing hydroprocessed lubricating oil stocks by the addition of hydrogen sulfide. 4,549,955, Cl. 208-59.000.
Shima, Atsushi: *See*—
Nozawa, Ryoichiro; Nagamine, Tsuyoshi; and Shima, Atsushi, 4,550,378, Cl. 364-474.000.
Shimada, Shigeru; Kakumoto, Shigeru; and Abe, Osamu, to Hitachi, Ltd. Line recognition. 4,550,434, Cl. 382-9.000.
Shimizu, Hiroshi: *See*—
Arai, Tetsuji; and Shimizu, Hiroshi, 4,550,245, Cl. 219-405.000.
Shimizu, Shoji, to Excell Corporation. Method for molding plastic products. 4,550,008, Cl. 264-527.000.
Shimizu, Susumu: *See*—
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizu, Susumu; Watanabe, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,549,902, Cl. 71-90.000.
Shimizu, Takao: *See*—
Suminoe, Taro; Ito, Tetsuo; Kiyomatsu, Yasuhiro; and Shimizu, Takao, 4,550,001, Cl. 264-2.600.
Shimon, Dale H. Hay bale carrier. 4,549,743, Cl. 280-47.13R.
Shimrock, Thomas; Taylor, R. Dirk; and Collins, John M., Jr., to Engelhard Corporation. Method of impregnating ceramic monolithic structures with predetermined amounts of catalyst. 4,550,034, Cl. 427-243.000.
Shin-Etsu Chemical Co., Ltd.: *See*—
Takamizawa, Minoru; Kobayashi, Taishi; Hayashida, Akira; and Takeda, Yoshihumi, 4,550,151, Cl. 528-7.000.
Shinkawa, Hiroyasu: *See*—
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizu, Susumu; Watanabe, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,549,902, Cl. 71-90.000.
Shino, Akimitsu: *See*—
Yanagishima, Takayuki; Kasai, Junichi; Ajimine, Akio; Watanabe, Tatsuya; Shino, Akimitsu; and Murakami, Yoshiaki, 4,550,428, Cl. 381-86.000.
Shinohara, Takeru: *See*—
Horiuchi, Shigenori; and Shinohara, Takeru, 4,549,789, Cl. 350-358.000.

Shioyama, Tod K., to Phillips Petroleum Company. Catalysts. 4,550,212, Cl. 568-401.000.

Shipley, John M.: *See—*
Buchanan, James E.; and Shipley, John M., 4,550,342, Cl. 358-153.000.

Shippey, Michael A., to Chevron Research Company. Overbased ortho-carboxy phenylphenone lubricating oil additives. 4,550,197, Cl. 562-460.000.

Shirai, Mitsuru; Fukuda, Nobuo; Yamamoto, Akira; and Tsuji, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Heat exchanging device with heat exchanging plates. 4,549,603, Cl. 165-104.330.

Shirai, Shunichi: *See—*
Sugino, Toshiya; Nohara, Fujio; Fujinawa, Tomoaki; Ogawa, Kazuo; Mizukami, Teruo; and Shirai, Shunichi, 4,550,118, Cl. 514-383.000.

Shmulovich, Joseph: *See—*
Berkstresser, George W.; Huo, Tai-Chan D.; and Shmulovich, Joseph, 4,550,256, Cl. 250-483.100.

Short, Edward H., III, to BS&B Safety Systems, Inc. Reclosing rupture disk assembly. 4,549,565, Cl. 137-71.000.

Shuman, Anthony J.: *See—*
Walker, Gary E.; Spiegel, Leo; Shuman, Anthony J.; and Kirtley, James L., Jr., 4,550,228, Cl. 179-115.00V.

Siebenand, John F.: *See—*
Andersen, David P.; Hedin, Raymond C.; and Siebenand, John F., 4,550,425, Cl. 381-30.000.

Siebert, Hans-Joachim: *See—*
Grieshaber, Hermann; and Siebert, Hans-Joachim, 4,549,511, Cl. 123-263.000.

Siegfried Aktiengesellschaft: *See—*
Mixich, Georg; and Thiele, Kurt, 4,550,175, Cl. 548-341.000.

Siemag Transplan GmbH: *See—*
Ganseuer, Horst, 4,549,700, Cl. 242-56.00R.

Siemens Aktiengesellschaft: *See—*
Aichinger, Horst; Marhoff, Paul; and Pfeiler, Manfred, 4,550,419, Cl. 378-099.000.
Freise, Werner, 4,550,280, Cl. 318-701.000.
Hanni, Manfred; and Brusch, Josef, 4,550,222, Cl. 179-1.50R.
Steinemer, Norbert, 4,550,234, Cl. 200-144.00B.
Stoeberl, Walter, 4,549,826, Cl. 400-708.000.
Von Gentzkow, Wolfgang; Schmiedel, Manfred; and Tussing, Reinhold, 4,550,204, Cl. 364-134.000.

Siemens Gammasonics, Inc.: *See—*
Groch, Mark W.; and Domnanovich, James R., 4,549,552, Cl. 128-700.000.

Signode Corporation: *See—*
Nikolich, Milovan, 4,549,344, Cl. 29-432.000.

Sikkenga, David L., to Standard Oil Company (Indiana). Non-aqueous exchange of acidic sites on molecular sieves. 4,550,091, Cl. 502-62.000.

Silver, Jack: *See—*
Hider, Robert C.; Kontoghiorghes, George; Silver, Jack; and Stockham, Michael A., 4,550,101, Cl. 514-188.000.

Silverman, Lawrence H.: *See—*
Rozario, Novellone; and Silverman, Lawrence H., 4,550,265, Cl. 307-494.000.

Simms, Robert A. Polarized glass. 4,549,795, Cl. 351-163.000.

Simon, Virgil S.; Gutowsky, Arthur C.; and Haluzak, Nestor T., to Thomas A. Schutz Co., Inc. Apparatus for mounting a device on a slotted post. 4,549,712, Cl. 248-224.400.

Simplex Ceiling Corporation: *See—*
Nassof, Martin, 4,549,375, Cl. 52-39.000.

Sisson, Jeffrey L.: *See—*
Braun, Oskar J.; Hubler, Lawrence C.; and Sisson, Jeffrey L., 4,549,804, Cl. 355-14.0SH.

Sitzwohl, Kenneth J.: *See—*
Gowan, Norman H.; Petravicius, Stasys; Hernandez, Ignacio T.; Kuhlmann, Robert E.; Vande Walle, Donald R., Jr.; Weddell, Ronald P.; Gates, Joseph M.; Sitzwohl, Kenneth J.; Sands, Charles D.; Gwinn, Rick A.; and Peterman, Milton J., 4,549,664, Cl. 211-131.000.

SKF Industrial Trading & Development Company B.V.: *See—*
Kumpar, Zvonimir Z., 4,549,872, Cl. 464-141.000.
Merkelbach, Boy, 4,550,237, Cl. 219-121.0LD.

SKF Kugellagerfabriken GmbH: *See—*
Hans, Rudiger; and Brandenstein, Manfred, 4,549,442, Cl. 74-110.000.

Skiles, Jerry W.: *See—*
Suh, John T.; Skiles, Jerry W.; Williams, Bruce E.; and Schwab, Alfred, 4,549,992, Cl. 260-455.00R.

Skiles, Richard D.: *See—*
Pilgram, Kurt H.; and Skiles, Richard D., 4,550,121, Cl. 514-469.000.

Sklavounos, Constantine: *See—*
Goldman, Irving M.; Kuhla, Donald E.; and Sklavounos, Constantine, 4,550,164, Cl. 544-291.000.

Skocpol, William J.: *See—*
Damen, Theodoor C.; Duguay, Michael A.; Howard, Richard E.; Jackel, Lawrence D.; and Skocpol, William J., 4,550,249, Cl. 250-201.000.

Skov, Per S.; Norn, Svend; and Weeke, Bent. Method of detecting or determining histamine in histamine containing materials. 4,550,085, Cl. 436-98.000.

Smades, Jack E., to Sanders Associates, Inc. Precision wire grid glass digitizing tablets. 4,549,918, Cl. 156-160.000.

Smialek, Raymond J.: *See—*
Polan, Ned W.; Smialek, Raymond J.; and Parthasarathi, Arvind, 4,549,950, Cl. 204-206.000.

Smid, Zdenek: *See—*
Husak, Zdenek; Svozil, Zdenek; Mazak, Ivan; Lehky, Josef; Hora, Josef; Smid, Zdenek; and Kebrle, Ondrej, 4,549,742, Cl. 280-11.180.

Smith, Daniel J.: *See—*
Gressett, Charles A., Jr.; and Smith, Daniel J., 4,549,460, Cl. 84-298.000.

Smith International, Inc.: *See—*
Seger, Fritz O., 4,549,718, Cl. 251-121.000.

Smith, James A., to Creative Products Resource Associates, Ltd. Cosmetic applicator useful for skin moisturizing and deodorizing. 4,550,035, Cl. 427-398.100.

Smith, Jeffrey I. Apparatus for cooling beverage containers and the like. 4,549,409, Cl. 62-381.000.

Smith, Leslie H.: *See—*
Barlow, Jeffrey J.; and Smith, Leslie H., 4,550,111, Cl. 514-255.000.

Smith Meter, Inc.: *See—*
Erickson, Charles D., 4,549,426, Cl. 73-3.000.

Smith, Stephen F., to United States of America, National Aeronautics and Space Administration. Automatic oscillator frequency control system. 4,550,292, Cl. 331-2.000.

Smiths Food Group B.V.: *See—*
Entes, Peter C., 4,549,478, Cl. 99-536.000.

Smitley, Bruce B., to Republic Steel Corporation. Shelf assembly. 4,549,665, Cl. 211-191.000.

SMS Schloemann-Siemag, Inc.: *See—*
Crates, Charles A., 4,549,822, Cl. 384-462.000.

Snyder, Hal D. Venting device for gas-carrying systems. 4,549,475, Cl. 98-122.000.

S.p.A. Luigi Rizzi & C.: *See—*
Repetto, Silvio, 4,549,416, Cl. 69-10.000.

Societe Anonyme DBA: *See—*
Deligny, Jean, 4,549,709, Cl. 248-56.000.

Societe Anonyme de Telecommunications: *See—*
Beynie , Claude P., 4,550,403, Cl. 370-110.100.

Societe d'Etudes Scientifiques et Industrielles de l'Ile-de France: *See—*
Perrot, Jacques; and Thominet, Michel, 4,550,179, Cl. 548-571.000.

Societe dite: Exsymol S.A.M.: *See—*
Seguin, Marie-Christine; and Gueyne, Jean, 4,549,990, Cl. 260-397.250.

Societe E. Lacroix - Tous Artifices: *See—*
Billard, Alain; Calmettes, Hubert; and Santalucia, Andre , 4,549,489, Cl. 102-505.000.

Societe Nationale Elf Aquitaine: *See—*
Basset, Jean M. M.; Leconte, Michel; Ollivier, Jean; and Quignard, Francoise, 4,550,216, Cl. 585-645.000.

Societe Nationale Elf Aquitaine (Production): *See—*
Morin, Daniel; and Prechner, Roland, 4,549,584, Cl. 141-73.000.

Societe Nationale Industrielle et Aerospatiale: *See—*
Auberon, Marcel; Cabanel, Daniel; Dolbeau, Michel; Phan, Albert; Pillois, Philippe; Bournazel, Claude L.; and Huvey, Michel, 4,549,919, Cl. 156-172.000.
Larribe, Andre P., 4,549,864, Cl. 425-145.000.

Soeiinah, Edy, to Mobil Oil Corporation. Measuring torque and hook load during drilling. 4,549,431, Cl. 73-151.000.

Software Distribution Newtork, Inc.: *See—*
Billings, Raymond J., 4,550,350, Cl. 360-15.000.

Solis, S.r.l.: *See—*
Gazzarrini, Vinicio, 4,549,493, Cl. 112-121.150.

Soloco, Inc.: *See—*
Hebert, Francis A., 4,549,682, Cl. 227-119.000.

Somoano, Robert B.: *See—*
Yen, Shiao-Ping S.; Carter, Boyd J.; Shen, David H.; and Somoano, Robert B., 4,550,064, Cl. 429-94.000.

Sonns, Eugen: *See—*
Huckler, Volker; Sonns, Eugen; Schafer, Helmut; and Nobis, Dieter, 4,549,637, Cl. 192-3.630.

Sony Corporation: *See—*
Hayafuji, Yoshinori; Sawada, Akashi; Usui, Setsuo; and Shibata, Akikazu, 4,549,913, Cl. 148-33.000.
Okuyama, Yoshikazu; and Takeuchi, Hajime, 4,550,349, Cl. 360-10.200.

Sony/Tektronix Corporation: *See—*
Takita, Kentaro, 4,550,387, Cl. 364-900.000.

Sooch, Navdeep S., to AT&T Bell Laboratories. MOS Cascode current mirror. 4,550,284, Cl. 323-315.000.

Soto, Jose M. P.; Noverola, Armando V.; Mauri, Jacinto M.; and Spickett, Robert G. W., to Fordonal, S.A. Piperidine derivatives. 4,550,116, Cl. 514-327.000.

Souji, Ichikawa, to Mitutoyo Mfg. Co., Ltd. Displacement measuring instrument. 4,549,353, Cl. 33-125.00R.

South Africa Inventions Development Corporation: *See—*
Polson, Alfred, 4,550,019, Cl. 424-85.000.

Southeastern Crane Fork: *See—*
Fowler, Aubrey A., Jr., 4,549,759, Cl. 294-67.200.

Spacelabs, Inc.: *See—*
Hochberg, Howard M., 4,549,553, Cl. 128-719.000.

Spacesaver Corporation: *See—*
Schindler, Michael D., 4,549,777, Cl. 312-198.000.

Spears, Danny R., to AT&T Bell Laboratories. Delivery information packet switching system. 4,550,401, Cl. 370-85.000.

Sperry Corporation: *See*—
Andersen, David P.; Hedin, Raymond C.; and Siebenand, John F., 4,550,425, Cl. 381-30.000.
DeCoene, Frans J. G. C., 4,549,480, Cl. 100-88.000.
McLean, Kenneth W., 4,549,390, Cl. 56-13.600.

Spickett, Robert G. W.: *See*—
Soto, Jose M. P.; Noverola, Armando V.; Mauri, Jacinto M.; and Spickett, Robert G. W., 4,550,116, Cl. 514-327.000.

Spiegel, Leo: *See*—
Walker, Gary E.; Spiegel, Leo; Shuman, Anthony J.; and Kirtley, James L., Jr., 4,550,228, Cl. 179-115.00V.

Spielau, Paul; Fassbender, Helmut; and Weiss, Richard, to Dynamit Nobel Aktiengesellschaft. Laminate based on epoxy resin for printed circuits. 4,550,051, Cl. 428-285.000.

Spielvogel, Bernard F.: *See*—
McPhail, Andrew T.; Spielvogel, Bernard F.; and Hall, Iris H., 4,550,186, Cl. 556-8.000.

Spirax Sarco, Inc.: *See*—
Jiandani, Niranjan T., 4,549,691, Cl. 236-58.000.

Spliethoff, Heinz, to Saarbergwerke Aktiengesellschaft. Method and apparatus for reducing the initial start-up and subsequent stabilization period losses, for increasing the usable power and for improving the controllability of a thermal power plant. 4,549,401, Cl. 60-652.000.

Spotz, Mark S.: *See*—
Adamowicz, John A.; Schlup, John R.; and Spotz, Mark S., 4,549,931, Cl. 162-145.000.

Sprecker, Mark A.: *See*—
Hall, John B.; Sprecker, Mark A.; Belko, Robert P.; Van Loveren, Augustinus G.; and Hanna, Marie R., 4,549,982, Cl. 252-522.00R.
Wiegers, Wilhelmus J.; and Sprecker, Mark A., 4,549,983, Cl. 252-522.00R.

Springer, Richard E.; and Baxter, Gary R., to Crosby Group, Inc., The. Trunnion for hook and block assembly. 4,549,829, Cl. 403-57.000.

Springs Industries, Inc.: *See*—
Hendrix, James E.; Daniels, John Y.; and White, Taryn M., 4,549,880, Cl. 8-115.520.

Spy Mirrors, Inc.: *See*—
Harris, Richard J., Jr., 4,549,790, Cl. 350-624.000.

Stafford, Sally S.: *See*—
Forsythe, Jesse G., Jr.; and Stafford, Sally S., 4,549,655, Cl. 206-569.000.

Stahli, Peter, to E. Frohlich AG. Process for preparation of a row of two different and alternating types of drop wires, and an assembly resulting from such process. 4,549,333, Cl. 28-205.000.

Stamicarbon B.V.: *See*—
Minkhorst, Jan H. K., 4,549,757, Cl. 293-120.000.

Stanbery, Dan P.; and Valero, Juan A. Coving cutter assembly. 4,549,351, Cl. 30-293.000.

Standard Oil Company (Indiana): *See*—
Sikkenga, David L., 4,550,091, Cl. 502-62.000.

Standard Precision, Inc.: *See*—
Papp, John E.; and Reed, Antony S., 4,549,773, Cl. 308-3.800.

Stanescu, Mircea S.; and Crouch, E. Donald, Jr., to BOC Group, Inc., The. Processes for heat treating ferrous material. 4,549,911, Cl. 148-16.000.

Stanley, Chester A.: *See*—
Vukmanic, Ronald W.; Borucki, John S.; and Stanley, Chester A., 4,549,383, Cl. 52-667.000.

Stanton, Paul N.: *See*—
Hibbs, David A.; Rickey, Wynn P.; and Stanton, Paul N., 4,549,578, Cl. 137-624.110.

Starkstrom Gummersbach GmbH: *See*—
Lemmer, Helmut, 4,550,232, Cl. 200-16.00A.

Staro, Giorgio. Device for tensioning material on frames. 4,549,596, Cl. 160-374.100.

Starr, John B., Jr.: *See*—
Jones, James F.; and Starr, John B., Jr., 4,550,155, Cl. 528-176.000.

Stauffer Chemical Company: *See*—
James, Donald R., 4,549,901, Cl. 71-94.000.

Steele, Robert E., to General Motors Corporation. Lamp monitor with latch circuit. 4,550,303, Cl. 340-80.000.

Steinemer, Norbert, to Siemens Aktiengesellschaft. Vacuum circuit breaker with two switching tubes connected in series for each pole. 4,550,234, Cl. 200-144.00B.

Stenkvist, Sven E.: *See*—
Lassander, Erik; and Stenkvist, Sven E., 4,550,413, Cl. 373-108.000.

Stenzel, Wallace J.; and Payne, Kenneth R., to Waukee Engineering Company. Meter monitor apparatus. 4,550,314, Cl. 340-623.000.

Stephan, Gunter; and Schundehutte, Karl Heinz, to Bayer Aktiengesellschaft. Process for the preparation of benzene compounds. 4,550,207, Cl. 564-311.000.

Stereoscopes Lestrade & Cie.: *See*—
Vitrac, Jean-Pierre, 4,549,785, Cl. 350-140.000.

Sterl, Rudolf, to Hestex Systems b.v. Slip-in fastening element for joining together two parts so that they may be undone. 4,549,832, Cl. 403-264.000.

Stevenson, John S., to Texaco Inc. Operation of gas generator. 4,549,886, Cl. 48-197.00R.

Stich, Bodo; Hassler, Ernst; and Cyphelly, Ivan-Jaroslav, to Glyco-Antriebstechnik GmbH. Hydraulic pump for low-viscosity pumping media. 4,549,862, Cl. 418-133.000.

Stickney, Truman M., to Rosemount Inc. Flow data sensor duct system. 4,549,706, Cl. 244-1.00R.

Stocker, Bruce A. D., to Leland Stanford Jr. University, The Board of Trustees of The. Non-reverting salmonella. 4,550,081, Cl. 435-253.000.

Stockham, Michael A.: *See*—
Hider, Robert C.; Kontoghiorghes, George; Silver, Jack; and Stockham, Michael A., 4,550,101, Cl. 514-188.000.

Stockingér, Friedrich; Lohse, Friedrich; and Zondler, Helmut, to Ciba Geigy Corporation. Process for the preparation of N-substituted N-cyancarboxylic acid amides. 4,550,203, Cl. 564-105.000.

Stodieck, Robert W.: *See*—
McTavish, Mary S.; Stodieck, Robert W.; and Doljack, Frank A., 4,550,301, Cl. 338-20.000.

Stoeberl, Walter, to Siemens Aktiengesellschaft. Paper feed apparatus for typewriters or business machines having a paper levelling gap disposed in the paper guidance channel. 4,549,826, Cl. 400-708.000.

Stoll GmbH and Company: *See*—
Stoll, Thomas; Ploppa, Jurgen; and Goller, Ernst, 4,549,412, Cl. 66-149.00R.

Stoll, Thomas; Ploppa, Jurgen; and Goller, Ernst, to Stoll GmbH and Company. Fabric take-down device for knitting machines. 4,549,412, Cl. 66-149.00R.

Stone, Alan M.: *See*—
Hawkins, Albert P.; Boyle, Alan; and Stone, Alan M., 4,549,659, Cl. 209-3.200.

Stone, Brian J.: *See*—
Sexton, John S.; Stone, Brian J.; Howes, Trevor D.; and Andrew, Colin, 4,549,372, Cl. 51-206.00R.

Stone, Gary H.: *See*—
Stone, Joel R.; and Stone, Gary H., 4,549,750, Cl. 283-79.000.

Stone, Joel R.; and Stone, Gary H. System for providing updated product and pricing information for retailer. 4,549,750, Cl. 283-79.000.

Stone, Kenton A. Portable jack for small tractors and like vehicles. 4,549,721, Cl. 254-126.000.

Stone, Wayne B., Jr., to Wood Manufacturing Co. Coffee making. 4,550,027, Cl. 426-433.000.

Stonestreet, Paul R.; Williams, David; Anderson, Kenneth; and Butcher, Peter J. L., to VG Instruments Group Limited. Sources used in molecular beam epitaxy. 4,550,411, Cl. 373-134.000.

Stovin, Garfield W.: *See*—
Ayers, Ralph L.; Stovin, Garfield W.; and Szabo, Robert J., 4,549,378, Cl. 52-169.120.

Stowe, Lawrence R.; and Strubhar, Malcolm K., to Mobil Oil Corporation. Hydraulic fracturing method employing special sand control technique. 4,549,608, Cl. 166-280.000.

Strachan, Bruce D.: *See*—
Holland, Scott B.; and Strachan, Bruce D., 4,550,286, Cl. 324-51.000.

Strauss, Peter: *See*—
Horbelt, Michael; Schnurle, Hans; Strauss, Peter; and Werner, Peter, 4,549,519, Cl. 123-493.000.

Streicher, William L.; and Propster, Mark A., to Owens-Corning Fiberglas Corporation. Apparatus and method for removing gaseous inclusions from molten material. 4,549,896, Cl. 65-135.000.

Stremmel, Gerd: *See*—
Evans, Elfed H.; Hirte, Klaus; and Stremmel, Gerd, 4,549,978, Cl. 252-109.000.

Stroem, Sigmunn; and Mowill, Rolf J., to A.S. Kongsberg Vapenfabrikk. High area ratio, variable entrance geometry compressor diffuser. 4,549,847, Cl. 415-182.000.

Strubhar, Malcolm K.: *See*—
Stowe, Lawrence R.; and Strubhar, Malcolm K., 4,549,608, Cl. 166-280.000.

Stuber, Fred A.: *See*—
Frulla, Floro F.; Stuber, Fred A.; and Whitman, Peter J., 4,550,188, Cl. 560-24.000.

Suenaga, Nobuyuki: *See*—
Toida, Masahiro; Suenaga, Norihiro; and Suenaga, Nobuyuki, 4,550,240, Cl. 219-121.0LS.

Suenaga, Norihiro: *See*—
Toida, Masahiro; Suenaga, Norihiro; and Suenaga, Nobuyuki, 4,550,240, Cl. 219-121.0LS.

Sugawara, Akinobu: *See*—
Tanaka, Kenji; Sugawara, Akinobu; and Yamawaki, Takashi, 4,550,143, Cl. 525-240.000.

Sugimoto, Koichi, to Hitachi, Ltd. Parabolic position and attitude interpolation for a robot hand. 4,550,383, Cl. 364-513.000.

Sugino, Toshiya; Nohara, Fujio; Fujinawa, Tomoaki; Ogawa, Kazuo; Mizukami, Teruo; and Shirai, Shunichi, to Ikeda Mohando Co., Ltd.; and Otsuka Pharmaceutical Co., Ltd. Heterocyclic compounds. 4,550,118, Cl. 514-383.000.

Sugita, Yutaka: *See*—
Toyooka, Takashi; Yoshida, Kazutoshi; Ishida, Kazuhiro; Okahashi, Tatsuo; Aoki, Hirokazu; Suzuki, Ryo; and Sugita, Yutaka, 4,550,388, Cl. 365-6.000.

Sugiura, Noboru: *See*—
Abe, Osamu; Mouri, Yasunori; and Sugiura, Noboru, 4,549,514, Cl. 123-425.000.

Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; and Yoshihara, Kenji, to Victor Company of Japan, Ltd. System for reproducing an address signal from each track turn during a search mode operation of a reproducing apparatus. 4,550,393, Cl. 369-32.000.

Suh, John T.; Skiles, Jerry W.; Williams, Bruce E.; and Schwab, Alfred, to USV Pharmaceutical Corp. Antihypertensive amides. 4,549,992, Cl. 260-455.00R.

Sumal, Jaihind S.: *See*—
Gneiss, Heinz; Sumal, Jaihind S.; and Wunsch, Werner, 4,549,433, Cl. 73-204.000.

Suminoe, Taro; Ito, Tetsuo; Kiyomatsu, Yasuhiro; and Shimizu, Takao, to Japan Synthetic Rubber Co., Ltd.; and Ricky Contact Lens Research Institute Inc. Process for producing shaped articles having improved surfaces. 4,550,001, Cl. 264-2.600.

Sumitomo Chemical Company, Limited: *See*—
Hanji, Katsumi; and Kawai, Kiyoshi, 4,550,094, Cl. 502-110.000.

Sumitomo Electric Industries, Ltd.: *See*—
Toda, Yuichi; Sakamoto, Katsuji; Tanaka, Shigeru; and Kameo, Yuji, 4,549,391, Cl. 57-13.000.

Sun Microsystems, Inc.: *See*—
Bechtolsheim, Andreas, 4,550,368, Cl. 364-200.000.

Sunbeam Corporation: *See*—
Crowley, George C.; Carlson, Gordon S.; and Woznicki, Michael, 4,550,358, Cl. 361-42.000.

Suncor, Inc.: *See*—
Tchernyak, Shimon S., 4,549,935, Cl. 196-14.520.

Sundahl, James G., to Bell Helmets Inc. Helmet system. 4,549,541, Cl. 128-201.190.

Sundstrand Corporation: *See*—
Blain, Edward S., 4,549,861, Cl. 418-55.000.
Vaidya, Jayant G., 4,550,267, Cl. 310-184.000.

Sundstrand Data Control, Inc.: *See*—
Pulk, Brian E.; and Bateman, Charles D., 4,550,385, Cl. 364-558.000.

Superior Scale Co. Ltd.: *See*—
Leiman, Leslie L., 4,549,622, Cl. 177-134.000.

Suzuka, Susumu: *See*—
Gonda, Michihiro; Kitsukawa, Katsumasa; Suzuka, Susumu; Kanasugi, Mikiko; Sato, Yutaka; and Otomo, Kikuo, 4,550,329, Cl. 346-214.000.

Suzuki, Naomichi: *See*—
Tamaru, Munetaka; and Suzuki, Naomichi, 4,550,324, Cl. 346-76.0PH.

Suzuki, Norio: *See*—
Nagasawa, Kouichi; Ikeda, Shuji; Suzuki, Norio; and Sakai, Yoshio, 4,549,340, Cl. 29-571.000.

Suzuki, Osamu: *See*—
Oishi, Kengo; and Suzuki, Osamu, 4,549,922, Cl. 156-293.000.

Suzuki, Ryo: *See*—
Toyooka, Takashi; Yoshida, Kazutoshi; Ishida, Kazuhiro; Okahashi, Tatsuo; Aoki, Hirokazu; Suzuki, Ryo; and Sugita, Yutaka, 4,550,388, Cl. 365-6.000.

Suzuki, Saburo: *See*—
Hirai, Osamu; Kobayashi, Tetsuo; Kuwatsuka, Shunichiro; and Suzuki, Saburo, 4,550,353, Cl. 360-125.000.

Suzuki, Tomio: *See*—
Endo, Mitsushi; Taniguchi, Toshiaki; Sahara, Teruyoshi; Hayakawa, Noriyuki; Yoshitomi, Tatsuo; Takahashi, Kozo; Nagatani, Yoshiteru; Kawai, Hidenao; Kaizyo, Shuichi; Nakagawa, Yoichi; Yamagami, Kazuo; Takizawa, Teruo; and Suzuki, Tomio, 4,549,472, Cl. 98-34.600.

Svarc, Stefan: *See*—
Kung, Walter; and Svarc, Stefan, 4,549,582, Cl. 139-430.000.

Sve, Charles; and Muntz, Eric P., to United States of America, Air Force. Void detection and composition measurements in composite wires. 4,550,255, Cl. 250-359.100.

Svozil, Zdenek: *See*—
Husak, Zdenek; Svozil, Zdenek; Mazak, Ivan; Lehky, Josef; Hora, Josef; Smid, Zdenek; and Kebrle, Ondrej, 4,549,742, Cl. 280-11.180.

Sweetana, Andrew S., Jr.: *See*—
Gupta, Tapan K.; Carlson, William G.; Osterhout, Joseph C.; Boyette, Gerald B.; and Sweetana, Andrew S., Jr., 4,549,981, Cl. 252-518.000.

Swenson Spreader Company: *See*—
Manon, Kenneth P., 4,549,697, Cl. 239-681.000.

Swinehart, Frank, to E. F. Johnson Company. Adjustable multiturn air dielectric capacitor. 4,550,361, Cl. 361-295.000.

Symmons, George R.: *See*—
Hashmi, Mohammed S. J.; and Symmons, George R., 4,549,421, Cl. 72-41.000.

Syntex (U.S.A.) Inc.: *See*—
Liu, Yen-Ping; Ullman, Edwin F.; and Becker, Martin J., 4,550,017, Cl. 424-11.000.

Szabo, Robert J.: *See*—
Ayers, Ralph L.; Stovin, Garfield W.; and Szabo, Robert J., 4,549,378, Cl. 52-169.120.

Tachibana, Eiichi; Murayama, Koushou; and Isumi, Kenzo, to Dai Nippon Insatsu Kabushiki Kaisha. Sleeve-type gravure printing cylinder and method and apparatus for its assembly. 4,549,923, Cl. 156-423.000.

Tachikawa Spring Co., Ltd.: *See*—
Nishino, Takaichi, 4,549,766, Cl. 297-396.000.

Taillandier, Jean-Michel. Self-orientable barrier fence. 4,549,724, Cl. 256-12.500.

Taito, Yoshinori: *See*—
Ochiai, Masahiko; and Taito, Yoshinori, 4,549,352, Cl. 30-41.500.

Tajana, Alberto: *See*—
Nardi, Dante; Tajana, Alberto; Pennini, Renzo; Cazzulani, Pietro; Graziani, Gabriele; and Casadio, Silvano, 4,550,115, Cl. 514-320.000.

Takahama, Itsuro. Prosthetic device with a knee mechanism. 4,549,318, Cl. 623-44.000.

Takahara, Kazuhiro: *See*—
Yamaguchi, Hisashi; Asano, Toru; Takahara, Kazuhiro; Kurahashi, Keizo; and Andoh, Shizuo, 4,550,310, Cl. 340-365.00C.

Takahashi, Hisashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for discriminating a paper-like material. 4,550,433, Cl. 382-7.000.

Takahashi, Isao, to Hitachi, Ltd. Circuit breaker. 4,550,356, Cl. 361-9.000.

Takahashi, Kozo: *See*—
Endo, Mitsushi; Taniguchi, Toshiaki; Sahara, Teruyoshi; Hayakawa, Noriyuki; Yoshitomi, Tatsuo; Takahashi, Kozo; Nagatani, Yoshiteru; Kawai, Hidenao; Kaizyo, Shuichi; Nakagawa, Yoichi; Yamagami, Kazuo; Takizawa, Teruo; and Suzuki, Tomio, 4,549,472, Cl. 98-34.600.

Takahaski, Hitoshi; Yamaguchi, Satoru; and Nunokawa, Hideo, to Fujitsu Limited. Boosting circuit. 4,550,264, Cl. 307-264.000.

Takajoh, Toshi: *See*—
Izumitani, Tetsuro; Takajoh, Toshi; and Kinjo, Iwao, 4,549,895, Cl. 65-134.000.

Takama, Kenichirou: *See*—
Oishi, Kiyohiko; Kobashi, Kiyoshi; and Takama, Kenichirou, 4,549,398, Cl. 60-286.000.

Takamizawa, Minoru; Kobayashi, Taishi; Hayashida, Akira; and Takeda, Yoshihumi, to Shin-Etsu Chemical Co., Ltd. Organoborosilicon polymer and a method for the preparation thereof. 4,550,151, Cl. 528-7.000.

Takamoto, Kiichi: *See*—
Omata, Fujio; and Takamoto, Kiichi, 4,550,258, Cl. 260-505.100.

Takao, Mitsunori; Kimura, Takahiko; and Hirabayashi, Yuzi, to Nippondenso Company Ltd. Intake air amount control apparatus of internal combustion engine. 4,549,512, Cl. 123-339.000.

Takasago, Masahiro: *See*—
Maeda, Takeshi; Takasago, Masahiro; and Tsunoda, Yoshito, 4,550,394, Cl. 369-46.000.

Takayama, Suguru; Noguchi, Kiyoshi; and Kobayashi, Kouji, to TDK Corporation. Magnetic recording medium. 4,550,062, Cl. 428-611.000.

Takeda Chemical Industries, Ltd.: *See*—
Matsuo, Taisuke; Kishimoto, Shoji; and Ochiai, Michihiko, 4,550,105, Cl. 514-210.000.

Takeda, Kenji: *See*—
Ohno, Akio; and Takeda, Kenji, 4,549,803, Cl. 355-14.0FU.

Takeda, Yoshihumi: *See*—
Takamizawa, Minoru; Kobayashi, Taishi; Hayashida, Akira; and Takeda, Yoshihumi, 4,550,151, Cl. 528-7.000.

Takemae, Yoshihiro: *See*—
Kabashima, Katsuhiko; Takemae, Yoshihiro; Nozaki, Shigeki; Ohira, Tsuyoshi; Miyahara, Hatsuo; Kanai, Masakazu; and Enomoto, Seiji, 4,550,289, Cl. 324-158.00R.

Takemoto, Tadashi; Hijiya, Toyoto; and Yamatani, Tetsuo, to Ajinomoto Co., Inc. Method for manufacture of N-formylaspartic anhydride. 4,550,180, Cl. 549-253.000.

Takeshima, Sadao; and Ohe, Takeshi, to Jidosha Kiki Co., Ltd. Power steering apparatus. 4,549,627, Cl. 180-142.000.

Takeuchi, Hajime: *See*—
Okuyama, Yoshikazu; and Takeuchi, Hajime, 4,550,349, Cl. 360-10.200.

Takeuchi, Tomio: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Naganawa, Hiroshi; Sawa, Tsutomu; Uchida, Takeshi; and Imoto, Masaya, 4,550,159, Cl. 536-6.400.

Takita, Kentaro, to Sony/Tektronix Corporation. Circuit for detecting the occurrence of a plurality of signals in a predetermined sequence. 4,550,387, Cl. 364-900.000.

Takizawa, Teruo: *See*—
Endo, Mitsushi; Taniguchi, Toshiaki; Sahara, Teruyoshi; Hayakawa, Noriyuki; Yoshitomi, Tatsuo; Takahashi, Kozo; Nagatani, Yoshiteru; Kawai, Hidenao; Kaizyo, Shuichi; Nakagawa, Yoichi; Yamagami, Kazuo; Takizawa, Teruo; and Suzuki, Tomio, 4,549,472, Cl. 98-34.600.

Tamai, Masayoshi, to Fuji Xerox Co., Ltd. Drop sensor for an ink jet printer. 4,550,322, Cl. 346-75.000.

Tamaru, Munetaka; and Suzuki, Naomichi, to Citizen Watch Company Limited. Ink transfer thermal printer. 4,550,324, Cl. 346-76.0PH.

Tamba, Shinichi; and Mitadera, Takashi, to Kawasaki Jukogyo Kabushiki Kaisha. Breathing device for four stroke engine. 4,549,520, Cl. 123-572.000.

Tamura, Kohki: *See*—
Horiba, Tatsuo; Fujita, Kazunori; Matsuda, Shinpei; and Tamura, Kohki, 4,550,067, Cl. 429-213.000.

Tanaka, Kenji; Sugawara, Akinobu; and Yamawaki, Takashi, to Idemitsu Petrochemical Co., Ltd. Composition comprising ethylene-based polymers. 4,550,143, Cl. 525-240.000.

Tanaka, Shigeru: *See*—
Toda, Yuichi; Sakamoto, Katsuji; Tanaka, Shigeru; and Kameo, Yuji, 4,549,391, Cl. 57-13.000.

Tanaka, Shuntaro: *See*—
Kawai, Kensuke; and Tanaka, Shuntaro, 4,550,379, Cl. 364-494.000.

Tanaka, Tetsuro: *See*—
Inoue, Tadashi; and Tanaka, Tetsuro, 4,549,947, Cl. 204-182.400.

Tanaka, Tsutomu: *See*—
Nishikubo, Yasuhiko; Fujikawa, Toyoharu; and Tanaka, Tsutomu, 4,549,818, Cl. 374-178.000.
Yahagi, Mitsuhisa; Masunaga, Mikio; Watanabe, Shuichi; and Tanaka, Tsutomu, 4,549,593, Cl. 152-330.00R.

Tandy Corporation: *See*—
Rozporka, Richard E., 4,549,669, Cl. 220-306.000.

Taniguchi, Toshiaki: *See*—
Endo, Mitsushi; Taniguchi, Toshiaki; Sahara, Teruyoshi; Hayakawa, Noriyuki; Yoshitomi, Tatsuo; Takahashi, Kozo;

Nagatani, Yoshiteru; Kawai, Hidenao; Kaizyo, Shuichi; Nakagawa, Yoichi; Yamagami, Kazuo; Takizawa, Teruo; and Suzuki, Tomio, 4,549,472, Cl. 98-34.600.

Tanner, Howard M. C., to HGM, Inc. Optical shutter. 4,549,787, Cl. 350-315.000.

Tanner, William M.: *See—*
Lee, David N.; and Tanner, William M., 4,549,761, Cl. 296-206.000.

Tarjan, Peter P.; Miller, Sandra L.; and Martin, John, to Cordis Corporation. Implantable lead. 4,549,556, Cl. 128-785.000.

Tay, Ching-Hua; and Fairchild, Raymond S., to Abitibi-Price Inc. Tin compounds for brightness improvement of jack pine ultra. 4,549,929, Cl. 162-78.000.

Taylor, John H., to McGard, Inc. Locking valve construction. 4,549,569, Cl. 137-382.500.

Taylor, R. Dirk: *See—*
Shimrock, Thomas; Taylor, R. Dirk; and Collins, John M., Jr., 4,550,034, Cl. 427-243.000.

Taylor, Stephen A., to United Kingdom Atomic Energy Authority. Fluidic devices. 4,549,574, Cl. 137-565.000.

Tchernyak, Shimon S., to Suncor, Inc. Conditioning drum for a tar sands hot water extraction process. 4,549,935, Cl. 196-14.520.

TDK Corporation: *See—*
Takayama, Suguru; Noguchi, Kiyoshi; and Kobayashi, Kouji, 4,550,062, Cl. 428-611.000.

Teater, Albert G., to GTE Communication Systems Corporation. Subscriber's telephone circuit arranged to present constant impedance to a telephone line. 4,550,226, Cl. 179-81.00R.

Tecumseh Products Company: *See—*
Kaufman, Vernon R., 4,549,445, Cl. 74-579.00R.

Tee, Victor G., to De La Rue Systems Limited. Apparatus for detecting the thickness of sheets. 4,550,252, Cl. 250-223.00R.

Tektronix, Inc.: *See—*
Schmachtenberg, Richard, III, 4,549,783, Cl. 350-96.200.

Telectronics Pty. Ltd.: *See—*
Kelly, P. Richard; and Pedersen, John N., 4,549,546, Cl. 128-419.00F.

Telly, Gary R.; and Telly, Scott R. Ultrasonic welding system and method employing a reduced number of power supplies. 4,549,684, Cl. 228-110.000.

Telly, Scott R.: *See—*
Telly, Gary R.; and Telly, Scott R., 4,549,684, Cl. 228-110.000.

Tenhagen, Rolf: *See—*
Anderka, Gerold; and Tenhagen, Rolf, 4,549,828, Cl. 401-258.000.

Tennant, Chris B.: *See—*
Henderson, James A., Jr.; and Tennant, Chris B., 4,550,400, Cl. 370-85.000.

Tennant, William M.: *See—*
Flotow, Richard A.; and Tennant, William M., 4,549,643, Cl. 192-111.00A.

Tentelier, Jean: *See—*
Glachet, Charles; Francois, Daniel; Tentelier, Jean; and Frioux, Christian, 4,549,839, Cl. 414-7.000.

Terada, Toshimichi; Kuroyanagi, Tomomitsu; Kozima, Noboru; and Shibata, Akira, to Hitachi, Ltd. Magnetic video pilot signal recording/reproducing system. 4,550,345, Cl. 358-323.000.

Teraji, Tsutomu; Sakane, Kazuo; and Goto, Jiro, to Fujisawa Pharmaceutical Co. Ltd. Cephem compounds. 4,550,102, Cl. 514-206.000.

Teramachi, Hiroshi. Linear slide bearing. 4,549,772, Cl. 308-6.00C.

Terumo Kabushiki Kaisha: *See—*
Muramoto, Yutaka; and Ikegami, Taketoshi, 4,549,819, Cl. 374-178.000.

Testerman, Reeves E., to United States of America, Transportation. Fifth wheel lifter/protector. 4,549,747, Cl. 280-446.00R.

Texaco Inc.: *See—*
Mourao, Antonio M., 4,549,884, Cl. 44-57.000.
Stevenson, John S., 4,549,886, Cl. 48-197.00R.
Unvert, Susan D.; Vanderpool, Steven H.; and Knifton, John F., 4,550,209, Cl. 564-479.000.
Yeakey, Ernest L.; and Sanderson, John R., 4,550,184, Cl. 549-453.000.

Texas Instruments Incorporated: *See—*
Dittakavi, Ashok, 4,549,867, Cl. 434-337.000.

Texo Corporation: *See—*
Kinkelaar, Edmund W.; and Pekar, Howard G., 4,550,037, Cl. 427-443.100.

Theodor Grabener, Firma: *See—*
Trost, Nikolaus B.; and Groos, Heinz, 4,549,419, Cl. 72-4.000.

Theriot, Eugene J.: *See—*
Chodrow, Mark M.; Sander, Bernard T., Jr.; Sharpless, Charles H.; and Theriot, Eugene J., 4,550,404, Cl. 370-110.100.

Thermal Power Corporation: *See—*
O'Connor, Patrick, 4,549,364, Cl. 37-197.000.

Thermo Electron Corporation: *See—*
Judd, Michael; and Cooper, Joseph S., 4,549,933, Cl. 162-281.000.

Thermohauser Erwin Busch GmbH: *See—*
Busch, Erwin, 4,549,714, Cl. 248-349.000.

Thiele, Kurt: *See—*
Mixich, Georg; and Thiele, Kurt, 4,550,175, Cl. 548-341.000.

Thigpen, Hubert H.; and Clos, Richard J., to Celanese Corporation. Method of manufacture for paraformaldehyde prills. 4,550,213, Cl. 568-458.000.

Thimsen, James A.: *See—*
Caspari, Richard B.; Whipple, Terry L.; and Thimsen, James A., 4,549,540, Cl. 128-133.000.

Thomas A. Schutz Co., Inc.: *See—*
Simon, Virgil S.; Gutowsky, Arthur C.; and Haluzak, Nestor T., 4,549,712, Cl. 248-224.400.

Thomas Jefferson University: *See—*
Katz, Philip; Brenman, Henry S.; Lowry, Louis D.; and Schwartz, Harold, 4,550,427, Cl. 381-70.000.

Thomas, John S.: *See—*
Peppiatt, Harry R.; and Thomas, John S., 4,550,439, Cl. 383-8.000.

Thomas, Rudy V., to Allied Corporation. Pillar integrated web guide. 4,549,749, Cl. 280-808.000.

Thomas, Thomas J.: *See—*
Morris, Susan M.; Thomas, Thomas J.; and Kalz, Dietmar, 4,549,980, Cl. 252-301.230.

Thomas, William R.: *See—*
Nimke, Helmut E.; and Thomas, William R., 4,549,752, Cl. 285-55.000.

Thominet, Michel: *See—*
Perrot, Jacques; and Thominet, Michel, 4,550,179, Cl. 548-571.000.

Thompson, Richard T.; Hinkle, Philip; and Carroll, Robert B., to Loctite Corporation. Article containing a thixotropic additive and cyanoacrylate monomer employed for developing latent fingerprints. 4,550,041, Cl. 428-35.000.

Thompson, Richard W.: *See—*
Kerko, David J.; Morgan, David W.; and Thompson, Richard W., 4,550,087, Cl. 501-13.000.

Thompson, Stanley P. Flighting for horizontal dryers. 4,549,699, Cl. 241-91.000.

Thurber, Robert E.: *See—*
Prengaman, Richard J.; Thurber, Robert E.; Phipps, Joe; Greenberg, Ronald I.; Hom, Wai L.; Jaworski, James F.; and Riffle, Guy W., 4,550,318, Cl. 343-5.0PD.

Tidmarsh, David. Cargo container lift device. 4,549,842, Cl. 414-391.000.

Tiesman, Randy J., to Champion International Corporation. Article display package and blank therefor. 4,549,654, Cl. 206-486.000.

Tindall, Gary W., to Deere & Company. Instrument panel cover assembly. 4,549,625, Cl. 180-90.000.

Tindall, Joseph H.: *See—*
Bloch, Alf L.; and Tindall, Joseph H., 4,549,457, Cl. 83-582.000.

Tio, Cesario O.: *See—*
Musser, John H.; and Tio, Cesario O., 4,550,172, Cl. 548-180.000.

Toa Nenryo Kogyo Kabushiki Kaisha: *See—*
Imai, Masafumi; Yamamoto, Tadashi; Furuhashi, Hiroyuki; Ueno, Hiroshi; and Inaba, Naomi, 4,550,095, Cl. 502-119.000.

Tobin, Patrick L.; Green, Joseph W.; and Lerohl, John A. Game apparatus for use in backgammon-like games. 4,549,739, Cl. 273-248.000.

Toche, Calvin A.: *See—*
Cox, David L.; Ross, William E.; and Toche, Calvin A., 4,550,389, Cl. 365-37.000.

Toda, Yuichi; Sakamoto, Katsuji; Tanaka, Shigeru; and Kameo, Yuji, to Sumitomo Electric Industries, Ltd. Wire-like structure twisting machine. 4,549,391, Cl. 57-13.000.

Toganoh, Shigeo: *See—*
Arai, Ryuichi; and Toganoh, Shigeo, 4,550,053, Cl. 428-304.400.

Toida, Masahiro; Suenaga, Norihiro; and Suenaga, Nobuyuki, to Nippon Infrared Industries Co., Ltd. Laser irradiating apparatus. 4,550,240, Cl. 219-121.0LS.

Toishi, Yoshiyuki, to Yoshida Kogyo K. K. Apparatus for securing bottom end stop to fastener chain. 4,549,348, Cl. 29-767.000.

Tokai TRW & Co., Ltd.: *See—*
Abe, Michio; Maeda, Naoyuki; and Tokunaga, Shigemitsu, 4,549,628, Cl. 180-143.000.

Tokunaga, Shigemitsu: *See—*
Abe, Michio; Maeda, Naoyuki; and Tokunaga, Shigemitsu, 4,549,628, Cl. 180-143.000.

Tokura, Norihito; Kawai, Hisasi; Kohama, Tokio; and Kanehara, Kenji, to Nippon Soken, Inc. Signal converting apparatus. 4,550,308, Cl. 340-347.0NT.

Tokyo Denshi Kagaku Kabushiki Kaisha: *See—*
Uehara, Akira; Hijikata, Isamu; Nakane, Hisashi; and Nakayama, Muneo, 4,550,239, Cl. 219-121.0PG.
Uehara, Akira; Hijikata, Isamu; Nakane, Hisashi; and Nakayama, Muneo, 4,550,242, Cl. 219-121.0PG.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Hirata, Akio, 4,550,281, Cl. 318-723.000.
Iimori, Akiro, 4,549,805, Cl. 355-3.0SH.
Kawai, Kensuke; and Tanaka, Shuntaro, 4,550,379, Cl. 364-494.000.
Kimura, Mitsutoshi; and Morita, Masayuki, 4,550,272, Cl. 315-86.000.
Minekane, Tomiharu; Yokotani, Noboru; and Onuma, Takehiko, 4,549,809, Cl. 356-436.000.
Rokutanda, Takashi; and Nakamura, Hiroshi, 4,550,369, Cl. 364-200.000.
Sasaki, Itsuo, 4,550,295, Cl. 333-19.000.
Takahashi, Hisashi, 4,550,433, Cl. 382-7.000.
Toshimitsu, Kenshi, 4,550,334, Cl. 355-3.00R.

Tolmachev, Alexei I.: *See—*
Gjulling, Eduard V.; Djugovskaya, Larisa A.; Zabolotny, Dmitry I.; Kovtun, Jury P.; Liptuga, Nikolai I.; Litus, Viktor I.; Sambur, Marina B.; Romanov, Nikolai N.; Tolmachev, Alexei I.; Kirsanov, Alexandr V.; Pisanko, Viktor N.; Melnikov, Oleg F.; and Klochkov, Evgeny I., 4,550,170, Cl. 548-154.000.

Topholm, Christian, to Topholm & Westermann I/S. In-the-ear hearing aid. 4,550,227, Cl. 179-107.00E.

Topholm & Westermann I/S: *See—*
Topholm, Christian, 4,550,227, Cl. 179-107.00E.

Toray Industries, Inc.: *See*—
Ono, Masaaki; Miura, Yasuki; Motegi, Masahiko; and Okabe, Kazuo, 4,550,049, Cl. 428-141.000.

Torii, Nobutoshi; and Nihei, Ryo, to Fanuc Ltd. Automatic hand changing device for industrial robots. 4,549,846, Cl. 414-729.000.

Toshiba Kikai Kabushiki Kaisha: *See*—
Toyama, Fumiyasu; Murakoshi, Masaaki; Wakuda, Masanori; Sasaki, Junichi; Watanabe, Hirotoshi; Yukawa, Tomio; and Okayama, Yoshihiko, 4,550,366, Cl. 364-136.000.

Toshimitsu, Kenshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for forming an image by the use of an image carrier. 4,550,334, Cl. 355-3.00R.

Towle, Michael: *See*—
English, Raymond; and Towle, Michael, 4,549,315, Cl. 2-2.000.

Townsend Engineering Company: *See*—
Townsend, Ray T., 4,549,458, Cl. 83-42.000.

Townsend, Ray T., to Townsend Engineering Company. Method and means of apportioning and cutting meat. 4,549,458, Cl. 83-42.000.

Townsley, Malcolm G.: *See*—
Loshaek, Samuel; and Townsley, Malcolm G., 4,549,794, Cl. 351-161.000.

Toyama, Fumiyasu; Murakoshi, Masaaki; Wakuda, Masanori; Sasaki, Junichi; Watanabe, Hirotoshi; Yukawa, Tomio; and Okayama, Yoshihiko, to Toshiba Kikai Kabushiki Kaisha. Programmable sequence controller and system. 4,550,366, Cl. 364-136.000.

Toyo Engineering Corporation: *See*—
Matsumiya, Saburo; Uehara, Katsuya; Saito, Keiji; Michiki, Hideyuki; and Yaginuma, Kenichi, 4,549,904, Cl. 75-7.000.

Toyo Rubber Industry Co., Ltd., The: *See*—
Oohara, Riichiro, 4,550,147, Cl. 525-332.600.

Toyo Tire & Rubber Co., Ltd.: *See*—
Iwama, Satoshi; and Hashiyama, Mitsuaki, 4,550,135, Cl. 524-495.000.

Toyoda Koki Kabushiki Kaisha: *See*—
Fujiwara, Hidetoshi; and Sato, Akihiko, 4,549,566, Cl. 137-117.000.

Toyooka, Takashi; Yoshida, Kazutoshi; Ishida, Kazuhiro; Okahashi, Tatsuo; Aoki, Hirokazu; Suzuki, Ryo; and Sugita, Yutaka, to Hitachi, Ltd.; and Hitachi Microcomputer Engineering Ltd. Method of controlling stop operation of rotating magnetic field for magnetic bubble memory device. 4,550,388, Cl. 365-6.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Moriyama, Masakazu; and Saito, Takao, 4,550,317, Cl. 340-995.000.
Ootani, Hisao; and Maruyamano, Satoru, 4,549,641, Cl. 192-106.200.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Ito, Toshimitsu; Isobe, Toshiaki; and Hattori, Takashi, 4,550,373, Cl. 364-431.040.
Oishi, Kiyohiko; Kobashi, Kiyoshi; and Takama, Kenichirou, 4,549,398, Cl. 60-286.000.

Trail, Mel. Valve enclosure. 4,549,568, Cl. 137-382.000.

Trainor, James E.: *See*—
West, John D.; Trainor, James E.; and Karman, James D., 4,550,244, Cl. 219-158.000.

Tramontana, Joseph C.: *See*—
Ridder, Robert A.; and Tramontana, Joseph C., 4,550,333, Cl. 357-81.000.

Transinvest B.V.: *See*—
Bertels, Augustinus W. M., 4,550,259, Cl. 290-55.000.

Travlos, Constantine M.; Henderson, James A.; and Weixel, Mark. Contact insertion and wire lay robotic end effector apparatus. 4,549,347, Cl. 29-749.000.

TRE Semiconductor Equipment Corporation: *See*—
Meshman, Boris; Kerekes, Thomas A.; Green, Lawrence S.; and Karlinsky, David, 4,550,374, Cl. 364-490.000.

Tremmel, Robert A.; and Magda, Doina, to OMI International Corporation. Process for electrodepositing composite nickel layers. 4,549,942, Cl. 204-40.000.

Trendler, David, to MacLean-Fogg Company. Hinged tissue cassette apparatus. 4,549,670, Cl. 220-338.000.

Trenkle, Robert W.: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Wolff, Robin K.; Boden, Richard M.; and Yoshida, Takao, 4,549,971, Cl. 252-8.600.

Trick, Robert E., to Medical Engineering Corporation. Artificial sphincter with inflatable cuff. 4,549,531, Cl. 128-1.00R.

Trintignac, Christian; and Jaccod, Jean-Claude, to Regie Nationale des Usines Renault. Hydraulic control device, particularly for power steering. 4,549,468, Cl. 91-361.000.

Trio Kabushiki Kaisha: *See*—
Naito, Michinori, 4,550,423, Cl. 381-13.000.

Trost, Nikolaus B.; and Groos, Heinz, to Theodor Grabener, Firma. Blank-feeding system for die-stamping press. 4,549,419, Cl. 72-4.000.

Trummlitz, Gunter: *See*—
Engel, Wolfhard; Trummlitz, Gunter; Eberlein, Wolfgang; Mihm, Gerhard; Schmidt, Gunther; Hammer, Rudolf; and Giachetti, Antonio, 4,550,107, Cl. 514-220.000.

TRW Ehrenreich GmbH & Co. KG: *See*—
Mette, Ulrich, 4,549,830, Cl. 403-134.000.

Trybulski, Eugene J.: *See*—
Fryer, Rodney I.; Trybulski, Eugene J.; and Walser, Armin, 4,549,988, Cl. 260-239.0BB.

Tsentralnaya Experimentalno-issledovatelskaya Konstruktorsko-Tekhnologicheskaya Laboratoria Khimizatsii Selskogo Khozyaistva: *See*—
Minenko, Leonid; Belikov, Evgeny V.; Bobryshev, Oleg V.; Klyatis, Lev M.; Mescheryakov, Ivan K.; Osipov, Viktor G.; Osher, Mikhail I.; and Plyakin, Nikolai P., 4,549,760, Cl. 294-88.000.

Tsuchimoto, Takamitsu: *See*—
Hattori, Akira; and Tsuchimoto, Takamitsu, 4,550,367, Cl. 364-200.000.

Tsuji, Hiroshi: *See*—
Shirai, Mitsuru; Fukuda, Nobuo; Yamamoto, Akira; and Tsuji, Hiroshi, 4,549,603, Cl. 165-104.330.

Tsukahara, Hirokazu: *See*—
Kosaka, Takao; and Tsukahara, Hirokazu, 4,550,328, Cl. 346-201.000.

Tsunoda, Yoshito: *See*—
Maeda, Takeshi; Takasago, Masahiro; and Tsunoda, Yoshito, 4,550,394, Cl. 369-46.000.

Tuck, Alan D.: *See*—
Wilden, James K.; and Tuck, Alan D., 4,549,467, Cl. 91-307.000.

Turner, Jonathan S.; and Wyatt, Leonard F., to AT&T Bell Laboratories. Alternate paths in a self-routing packet switching network. 4,550,397, Cl. 370-60.000.

Tussing, Reinhold: *See*—
Von Gentzkow, Wolfgang; Schmiedel, Manfred; and Tussing, Reinhold, 4,550,204, Cl. 564-134.000.

Twin Disc, Incorporated: *See*—
White, Basil, 4,549,443, Cl. 74-360.000.

Twumasi, Daniel Y.: *See*—
Bacquet, Cathy A.; and Twumasi, Daniel Y., 4,550,075, Cl. 435-7.000.

Tzinis, Costas H.; and Vadimsky, Richard G., to AT&T Bell Laboratories. Sensitizing bath for chalcogenide resists. 4,550,074, Cl. 430-322.000.

U-S Safety Trolley Corp.: *See*—
Ross, Donald R., Sr., 4,550,231, Cl. 191-23.00A.

Uchida, Takeshi: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Naganawa, Hiroshi; Sawa, Tsutomu; Uchida, Takeshi; and Imoto, Masaya, 4,550,159, Cl. 536-6.400.

Uebel, Helmut, to International Standard Electric Corporation. Facility for intermittent transmission of information between guideway wayside equipment and vehicles moving along the guideway. 4,550,444, Cl. 455-41.000.

Ueda, Kenji, to Kabushiki Kaisha Ishida Koki Seisakusho. Apparatus for supporting a timing hopper in an automatic weighing system. 4,549,621, Cl. 177-105.000.

Uehara, Akira; Hijikata, Isamu; Nakane, Hisashi; and Nakayama, Muneo, to Tokyo Denshi Kagaku Kabushiki Kaisha. Automatic plasma processing device and heat treatment device. 4,550,239, Cl. 219-121.0PG.

Uehara, Akira; Hijikata, Isamu; Nakane, Hisashi; and Nakayama, Muneo, to Tokyo Denshi Kagaku Kabushiki Kaisha. Automatic plasma processing device and heat treatment device for batch treatment of workpieces. 4,550,242, Cl. 219-121.0PG.

Uehara, Katsuya: *See*—
Matsumiya, Saburo; Uehara, Katsuya; Saito, Keiji; Michiki, Hideyuki; and Yaginuma, Kenichi, 4,549,904, Cl. 75-7.000.

Uehara, Kazuo: *See*—
Hoashi, Kenzo; and Uehara, Kazuo, 4,549,466, Cl. 91-6.500.

Ueno, Hiroshi: *See*—
Imai, Masafumi; Yamamoto, Tadashi; Furuhashi, Hiroyuki; Ueno, Hiroshi; and Inaba, Naomi, 4,550,095, Cl. 502-119.000.

Ueno, Satoru: *See*—
Unno, Yohei; Ueno, Satoru; Sadamitsu, Kazuo; and Okamoto, Tsuneo, 4,549,581, Cl. 138-109.000.

Uhland, Eberhard; Dienst, Manfred; and Wente, Claus-Heinrich, to Hermann Berstorff Maschinenbau GmbH. Method and apparatus for achieving optimum discharge from a twin-screw extrusion device. 4,550,002, Cl. 264-40.100.

Ukigai, Toshiyuki: *See*—
Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Junichi; and Ukigai, Toshiyuki, 4,549,607, Cl. 166-274.000.

Ullman, Edwin F.: *See*—
Liu, Yen-Ping; Ullman, Edwin F.; and Becker, Martin J., 4,550,017, Cl. 424-11.000.

UMAC, Inc.: *See*—
Nimke, Helmut E.; and Thomas, William R., 4,549,752, Cl. 285-55.000.

Umbarger, C. John: *See*—
Waechter, David A.; Wolf, Michael A.; and Umbarger, C. John, 4,550,381, Cl. 364-527.000.

Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Naganawa, Hiroshi; Sawa, Tsutomu; Uchida, Takeshi; and Imoto, Masaya, to Microbial Chemistry Research Foundation. Anthracycline compounds. 4,550,159, Cl. 536-6.400.

Umezawa, Iwao; and Komiyama, Kanki, to Kitasato Institute, The. Antitumor antibiotic 81-484 and process for its production. 4,550,021, Cl. 424-122.000.

Uni-Cardan Aktiengesellschaft: *See*—
Krude, Werner, 4,549,873, Cl. 464-141.000.

Union Carbide Corporation: *See*—
Mellors, Geoffrey W., 4,549,943, Cl. 204-96.000.
Park, Hyun D.; and Brown, Arthur E., 4,550,088, Cl. 501-135.000.
Pickwell, Robert J.; and Osterholtz, Frederick D., 4,550,056, Cl. 428-391.000.

Rimsa, Stephen B.; Harris, James E.; Chao, Herbert S.; and Maresca, Louis M., 4,550,140, Cl. 525-132.000.
Union Oil Company of California: *See*—
Watkins, David R.; Knight, Robert K.; Young, Donald C.; and Kalfayan, Leonard J., 4,549,609, Cl. 166-303.000.
Uniroyal, Inc.: *See*—
Paddock, Charles F.; and Wefer, John M., 4,550,138, Cl. 525-67.000.
United Kingdom Atomic Energy Authority: *See*—
Kaye, Alan S., 4,550,409, Cl. 372-59.000.
Taylor, Stephen A., 4,549,574, Cl. 137-565.000.
United States Medical Corporation: *See*—
Meyer, Benjamin S., 4,549,319, Cl. 623-22.000.
United States of America
Air Force: *See*—
Driscoll, Michael M., 4,550,293, Cl. 331-116.00R.
Kolesar, Edward S., Jr., 4,549,427, Cl. 73-23.000.
O'Loughlin, James P., 4,550,275, Cl. 315-241.00R.
Sve, Charles; and Muntz, Eric P., 4,550,255, Cl. 250-359.100.
Army: *See*—
Betts, Robert E.; Crawford, John F.; and McNeill, Robert E., 4,549,486, Cl. 102-334.000.
Buchanan, James E.; and Shipley, John M., 4,550,342, Cl. 358-153.000.
Energy: *See*—
Baughman, Richard J.; and Ginley, David S., 4,550,014, Cl. 423-289.000.
Boettcher, Gordon E.; and Crain, Robert W., 4,550,273, Cl. 315-151.000.
Holcombe, Cressie E.; Masters, David R.; and Pfeiler, William A., 4,550,412, Cl. 373-155.000.
Horton, Joel R., 4,549,954, Cl. 208-8.0LE.
Waechter, David A.; Wolf, Michael A.; and Umbarger, C. John, 4,550,381, Cl. 364-527.000.
Health and Human Services: *See*—
VanPelt, Wilbur F.; and Peterson, Richard W., 4,550,422, Cl. 378-207.000.
National Aeronautics and Space Administration: *See*—
Barmatz, Martin B.; Granett, Dan; and Lee, Mark C., 4,549,435, Cl. 73-505.000.
Gilwee, William J., Jr., 4,550,129, Cl. 523-433.000.
Kumar, Devendra; Fohlen, George M.; and Parker, John A., 4,550,177, Cl. 548-413.000.
Smith, Stephen F., 4,550,292, Cl. 331-2.000.
Navy: *See*—
Lau, Yue-Ying; and Barnett, Larry R., 4,550,271, Cl. 315-4.000.
Transportation: *See*—
Testerman, Reeves E., 4,549,747, Cl. 280-446.00R.
U.S. Philips Corporation: *See*—
Compen, Johannes M. A. A.; and van Kemenade, Wilhelmus M. P., 4,550,032, Cl. 427-64.000.
Creel, Georges N.; and Morelle, Claude, 4,549,814, Cl. 374-2.000.
Gorris, Joannes J. H. M.; and Lenders, Wilhelmus L. L., 4,549,335, Cl. 29-866.000.
Kohsiek, Cord H., 4,550,262, Cl. 307-260.000.
Louiday, Andre E., 4,550,421, Cl. 378-196.000.
United Technologies Corporation: *See*—
Chenausky, Peter P.; Hoffman, Nelson N.; and Laughman, Lanny M., 4,550,410, Cl. 372-97.000.
Galasso, Francis S.; and Veltri, Richard D., 4,550,063, Cl. 428-614.000.
Hibyan, Edward S., 4,549,852, Cl. 416-140.000.
Norris, James R., 4,549,708, Cl. 244-129.400.
Reiner, Martin J.; and Fassler, Michael H., 4,549,599, Cl. 164-122.100.
University of Dayton, The: *See*—
Hedberg, Frederick L.; and Unroe, Marilyn R., 4,550,210, Cl. 568-33.000.
University of Illinois: *See*—
Cain, Charles A.; and Frizzell, Leon A., 4,549,533, Cl. 128-24.00A.
University of Pennsylvania, Trustees of the: *See*—
Brighton, Carl T.; Black, Jonathan; and Redka, William, 4,549,547, Cl. 128-419.00F.
Unno, Yohei; Ueno, Satoru; Sadamitsu, Kazuo; and Okamoto, Tsuneo, to Furukawa Electric Co., Ltd., The. Flexible pipe. 4,549,581, Cl. 138-109.000.
Unroe, Marilyn R.: *See*—
Hedberg, Frederick L.; and Unroe, Marilyn R., 4,550,210, Cl. 568-33.000.
Unvert, Susan D.; Vanderpool, Steven H.; and Knifton, John F., to Texaco Inc. Process for the preparation of iinear polyethylenepolyamines by reacting monoethanolamine with ethylenediamine in the presence of an intercalatively active catalyst. 4,550,209, Cl. 564-479.000.
Upadysheva, Alexandra V.: *See*—
Lavretskaya, Elionora F.; Rudzit, Ernest A.; Piruzian, Lev A.; Volkova, Ljubov I.; Zakharova, Nina I.; Sarkisian, David A.; Upadysheva, Alexandra V.; Grigorieva, Natalya D.; Znamenskaya, Anna P.; Libinzon, Rakhil E.; and Antonian, Semen G., 4,550,113, Cl. 514-290.000.
Usher, Peter P.; and Gavaletz, Eugene J., to Metex Corporation. Combination metal and knitted wire mesh gasket. 4,549,741, Cl. 277-236.000.
Ushio Denki Kabushiki Kaisha: *See*—
Arai, Tetsuji; and Shimizu, Hiroshi, 4,550,245, Cl. 219-405.000.
USM Corporation: *See*—
Mehta, Pradip S., 4,549,810, Cl. 366-75.000.
Ritschel, Peter; Freudenreich, Herbert; and Hartmann, Waldemar, 4,549,915, Cl. 156-78.000.
Usui, Setsuo: *See*—
Hayafuji, Yoshinori; Sawada, Akashi; Usui, Setsuo; and Shibata, Akikazu, 4,549,913, Cl. 148-33.000.
Usui, Toshifumi; and Yanagisawa, Syozo, to Hitachi, Ltd. Exhaust emission control system for diesel engine. 4,549,399, Cl. 60-286.000.
USV Pharmaceutical Corp.: *See*—
Suh, John T.; Skiles, Jerry W.; Williams, Bruce E.; and Schwab, Alfred, 4,549,992, Cl. 260-455.00R.
Vadimsky, Richard G.: *See*—
Tzinis, Costas H.; and Vadimsky, Richard G., 4,550,074, Cl. 430-322.000.
Vaidya, Jayant G., to Sundstrand Corporation. Redundant multiple channel electric motors and generators. 4,550,267, Cl. 310-184.000.
Valeo: *See*—
Loizeau, Pierre, 4,549,642, Cl. 192-106.200.
Valero, Juan A.: *See*—
Stanbery, Dan P.; and Valero, Juan A., 4,549,351, Cl. 30-293.000.
van der Lely, Cornelis. Vehicle with front and rear steerable wheels individually driven by hydraulic motors. 4,549,610, Cl. 172-3.000.
Vanderpool, Steven H.: *See*—
Unvert, Susan D.; Vanderpool, Steven H.; and Knifton, John F., 4,550,209, Cl. 564-479.000.
Vande Walle, Donald R., Jr.: *See*—
Gowan, Norman H.; Petravicius, Stasys; Hernandez, Ignacio T.; Kuhlmann, Robert E.; Vande Walle, Donald R., Jr.; Weddell, Ronald P.; Gates, Joseph M.; Sitzwohl, Kenneth J.; Sands, Charles D.; Gwinn, Rick A.; and Peterman, Milton J., 4,549,664, Cl. 211-131.000.
VanDewoestine, Robert V.: *See*—
Blanding, Wendell S.; Johnson, Ronald E.; and VanDewoestine, Robert V., 4,549,928, Cl. 156-660.000.
Van Herle, Louis; and Wittwer, Fritz, to Warner-Lambert Company. Apparatus and method for sealing capsules. 4,550,238, Cl. 219-121.0LC.
Van Hove, Emile, to Dredging International. Device for underwater sealing ports or similar, notably the bottom traps from hopper barges. 4,549,497, Cl. 114-36.000.
van Kemenade, Wilhelmus M. P.: *See*—
Compen, Johannes M. A. A.; and van Kemenade, Wilhelmus M. P., 4,550,032, Cl. 427-64.000.
Van Loveren, Augustinus G.: *See*—
Evers, William J.; Mookherjee, Braja D.; Van Ouwerkerk, Anton; and Van Loveren, Augustinus G., 4,549,972, Cl. 252-8.600.
Hall, John B.; Sprecker, Mark A.; Belko, Robert P.; Van Loveren, Augustinus G.; and Hanna, Marie R., 4,549,982, Cl. 252-522.00R.
Van Ouwerkerk, Anton: *See*—
Evers, William J.; Mookherjee, Braja D.; Van Ouwerkerk, Anton; and Van Loveren, Augustinus G., 4,549,972, Cl. 252-8.600.
Vanover, Bob, Sr. Belt buckle machine. 4,549,342, Cl. 29-3.000.
VanPelt, Wilbur F.; and Peterson, Richard W., to United States of America, Health and Human Services. Process and device for x-ray system quality assurance. 4,550,422, Cl. 378-207.000.
Varian Associates, Inc.: *See*—
Zitelli, Louis T.; and Schumacher, Richard T., 4,550,251, Cl. 250-213.0VT.
Variform Plastics, Inc.: *See*—
Ayers, Ralph L.; Stovin, Garfield W.; and Szabo, Robert J., 4,549,378, Cl. 52-169.120.
Varjabedian, Shanoor. Headache curing medical device. 4,549,536, Cl. 128-60.000.
Veb Zentrum fur Forschung und Technologie Mikroelektronik: *See*—
Wagner, Siegfried, 4,550,332, Cl. 357-38.000.
Veltri, Richard D.: *See*—
Galasso, Francis S.; and Veltri, Richard D., 4,550,063, Cl. 428-614.000.
Venkat, Chaya; and Walsh, Dennis E., to Mobil Oil Corporation. Measurement of ignition characteristics of distillate fuels. 4,549,815, Cl. 374-8.000.
Venturello, Carlo; and Ricci, Marco, to Montedison S.p.A. Process for the preparation of carboxylic acids starting from vicinal water-soluble diols. 4,550,196, Cl. 562-418.000.
Verner, Bo L.; and Fors, Lars B. S., to Atlas Copco Aktiebolag. Device for increasing the oxygen concentration in a subsurface stratum of a thermally stratified body of water. 4,549,997, Cl. 261-77.000.
Verney, Darrel E. Lifesaving ring. 4,549,871, Cl. 441-81.000.
Vettori, Claude; and Chauviere, Henri, to Etudes Techniques et Representations Industrielles E.T.R.I. Flat type fan, particularly for electronic circuits. 4,549,858, Cl. 417-353.000.
VG Instruments Group Limited: *See*—
Stonestreet, Paul R.; Williams, David; Anderson, Kenneth; and Butcher, Peter J. L., 4,550,411, Cl. 373-134.000.
Vianco, James E.: *See*—
Lehmann, Robert P.; and Vianco, James E., 4,550,396, Cl. 369-284.000.
Vianova Kunstharz, A.G.: *See*—
Paar, Willibald; and Honig, Helmut, 4,550,146, Cl. 525-327.300.
Victor Company of Japan, Ltd.: *See*—
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; and Yoshihara, Kenji, 4,550,393, Cl. 369-32.000.
Vierling, Karl-Heinz: *See*—
Karning, Heinrich; Prein, Franz; and Vierling, Karl-Heinz, 4,550,408, Cl. 372-58.000.

Vikio, Pentti, to Enso-Gutzeit Oy. Device for flushing obstructions from the reject head of a centrifugal separator. 4,549,964, Cl. 210-369.000.

Villar, Federico F.: *See*—
Harter, Elton H.; and Villar, Federico F., 4,549,479, Cl. 99-625.000.

Villax, Ivan: *See*—
Page, Philip R.; and Villax, Ivan, 4,550,096, Cl. 502-166.000.

Vincent, Alan H., to Westland plc. Helicopter rotors. 4,549,850, Cl. 416-140.000.

Vincent, Michael T.: *See*—
Groeneveld, Wilbur E.; Kluver, Leroy; and Vincent, Michael T., 4,549,481, Cl. 100-98.00R.

Viola, Michael S., to Polaroid Corporation. Drop dispensing device. 4,550,325, Cl. 346-140.00R.

Vitafin N.V.: *See*—
Wittkampf, Frederik H. M.; and Boute, Willem, 4,549,548, Cl. 128-419.0PG.

Vitrac, Jean-Pierre, to Stereoscopes Lestrade & Cie. Stereo viewer. 4,549,785, Cl. 350-140.000.

Volkova, Ljubov I.: *See*—
Lavretskaya, Elionora F.; Rudzit, Ernest A.; Piruzian, Lev A.; Volkova, Ljubov I.; Zakharova, Nina I.; Sarkisian, David A.; Upadysheva, Alexandra V.; Grigorieva, Natalya D.; Znamenskaya, Anna P.; Libinzon, Rakhil E.; and Antonian, Semen G., 4,550,113, Cl. 514-290.000.

Volz, Hartwig; and Willmann, Egon, to Deutsche Texaco Aktiengesellschaft. Apparatus for mixing a solution. 4,549,813, Cl. 366-160.000.

Von Gentzkow, Wolfgang; Schmiedel, Manfred; and Tussing, Reinhold, to Siemens Aktiengesellschaft. Method and apparatus for the manufacture of N,N'-bis-(aroyl)hydrazines. 4,550,204, Cl. 564-134.000.

Vorwerk & Co. Interholding GmbH: *See*—
Becker, Dietmar; and Wilcke, Klaus-Dieter, 4,550,268, Cl. 310-239.000.

Voss, Houston F.; Plattner, Jacob; and Herrin, Thomas R., to Abbott Laboratories. Ligand analog-irreversible enzyme inhibitor conjugates. 4,550,163, Cl. 544-244.000.

Vrouenraets, Cornelius M. F., to Akzo N.V. Packaged smoked foodstuff. 4,550,025, Cl. 426-105.000.

Vuceta, Ivan: *See*—
Grabovac, Bosko; and Vuceta, Ivan, 4,549,438, Cl. 73-862.210.

Vukmanic, Ronald W.; Borucki, John S.; and Stanley, Chester A., to Chicago Metallic Corporation. Suspended ceiling grid system. 4,549,383, Cl. 52-667.000.

W. A. Whitney Corp.: *See*—
Scott, William B.; and Ahmer, Bruce E., 4,550,241, Cl. 219-121.0LG.

W. Haking Enterprises Limited: *See*—
Winter, Arthur J., 4,549,801, Cl. 354-403.000.

W. P. Hickman Company: *See*—
Hickman, John B., 4,549,376, Cl. 52-94.000.

Wacker, Karl F.: *See*—
Bellemann, Rudolf; Diehlmann, Rolf; Dobrocsi, Bela; and Wacker, Karl F., 4,549,961, Cl. 210-108.000.

Waco International Corporation: *See*—
Duncan, Charles W.; and Murray, David G., 4,549,634, Cl. 182-179.000.

Waddingtons Games Limited: *See*—
Fisher, Denys, 4,550,040, Cl. 428-33.000.

Waechter, David A.; Wolf, Michael A.; and Umbarger, C. John, to United States of America, Energy. Spectrometer gun. 4,550,381, Cl. 364-527.000.

Wagner, Siegfried, to Veb Zentrum fur Forschung und Technologie Mikroelektronik. Gate controlled semiconductor device. 4,550,332, Cl. 357-38.000.

Waitkus, Phillip A.: *See*—
Korb, Louis L.; and Waitkus, Phillip A., 4,550,015, Cl. 423-445.000.

Wakabayashi, Manabu; Minami, Kihachiro; Sanpei, Tohru; and Konno, Kazutoshi, to Hitachi, Ltd. Disc cassette (disc cartridge). 4,550,354, Cl. 360-133.000.

Wakuda, Masanori: *See*—
Toyama, Fumiyasu; Murakoshi, Masaaki; Wakuda, Masanori; Sasaki, Junichi; Watanabe, Hirotoshi; Yukawa, Tomio; and Okayama, Yoshihiko, 4,550,366, Cl. 364-136.000.

Walker, Edward S.: *See*—
Schoenig, Frederick C., Jr.; Landry, J. David; Walker, Edward S.; and Lai, Ching C., 4,549,662, Cl. 209-539.000.

Walker, Gary E.; Spiegel, Leo; Shuman, Anthony J.; and Kirtley, James L., Jr., to Apogee Acoustics, Inc. Ribbon speaker system. 4,550,228, Cl. 179-115.00V.

Walker, Joseph W.: *See*—
Fowler, Aubrey A., Jr., 4,549,759, Cl. 294-67.200.

Walko, Ronald J.: *See*—
Bukowski, James M.; Midock, Gary E.; and Walko, Ronald J., 4,550,380, Cl. 364-494.000.

Wallace, Bruce A.: *See*—
Hindman, David B.; Gerlach, Lawrence L.; and Wallace, Bruce A., 4,549,893, Cl. 65-28.000.

Wallis, Bruce: *See*—
Kot, Vincent; Wallis, Bruce; and Robinson, Alfred, 4,549,755, Cl. 285-341.000.

Wallman, Lennart. Arrangement for radial fans. 4,549,848, Cl. 415-206.000.

Walser, Armin: *See*—
Fryer, Rodney I.; Trybulski, Eugene J.; and Walser, Armin, 4,549,988, Cl. 260-239.0BB.

Walsh, Dennis E.: *See*—
Venkat, Chaya; and Walsh, Dennis E., 4,549,815, Cl. 374-8.000.

Walter, James M.: *See*—
Dischert, Robert A.; Moles, Warren H.; Rhodes, Roland N.; and Walter, James M., 4,550,337, Cl. 358-13.000.

Walther, Gerhard: *See*—
Schneider, Claus; Walther, Gerhard; Weber, Karl-Heinz; Bechtel, Wolf D.; and Boke-Kuhn, Karin, 4,550,106, Cl. 514-212.000.

Walton, James P., Jr.: *See*—
Lopatin, George; Coplan, Myron J.; and Walton, James P., Jr., 4,550,123, Cl. 521-64.000.

Warmbold, Gert: *See*—
Otto, Gunther; and Warmbold, Gert, 4,550,420, Cl. 378-171.000.

Warner-Lambert Company: *See*—
Ambike, Suhas H.; Grewal, Narinder S.; and Blaser, Eric, 4,550,018, Cl. 424-52.000.
Mich, Thomas F.; and Culbertson, Townley P., 4,550,103, Cl. 514-210.000.
Mich, Thomas F.; and Sanchez, Joseph P., 4,550,104, Cl. 514-210.000.
Morrison, Glenn C., 4,550,119, Cl. 514-394.000.
Van Herle, Louis; and Wittwer, Fritz, 4,550,238, Cl. 219-121.0LC.

Warner & Swasey Company, The: *See*—
Deis, Jerome E., 4,550,418, Cl. 377-17.000.

Warren, Timothy P. Control handle arrangement for a fluid control valve. 4,549,716, Cl. 251-96.000.

Wartenbergh, Robert P.: *See*—
Larson, Bert R.; and Wartenbergh, Robert P., 4,550,355, Cl. 360-133.000.

Wass, Lloyd G. Raft inflation valve. 4,549,870, Cl. 441-41.000.

Watanabe, Hirotoshi: *See*—
Toyama, Fumiyasu; Murakoshi, Masaaki; Wakuda, Masanori; Sasaki, Junichi; Watanabe, Hirotoshi; Yukawa, Tomio; and Okayama, Yoshihiko, 4,550,366, Cl. 364-136.000.

Watanabe, Shuichi; and Katakabe, Noboru, to Matsushita Electric Industrial Co., Ltd. Solenoid. 4,550,302, Cl. 335-228.000.

Watanabe, Shuichi: *See*—
Yahagi, Mitsuhisa; Masunaga, Mikio; Watanabe, Shuichi; and Tanaka, Tsutomu, 4,549,593, Cl. 152-330.00R.

Watanabe, Takeo: *See*—
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizu, Susumu; Watanabe, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,549,902, Cl. 71-90.000.

Watanabe, Tatsuya: *See*—
Yanagishima, Takayuki; Kasai, Junichi; Ajimine, Akio; Watanabe, Tatsuya; Shino, Akimitsu; and Murakami, Yoshiaki, 4,550,428, Cl. 381-86.000.

Watkins, David R.; Knight, Robert K.; Young, Donald C.; and Kalfayan, Leonard J., to Union Oil Company of California. Treating fines-containing earthen formations. 4,549,609, Cl. 166-303.000.

Watson, Bruce R., to General Electric Company. Method for slitting amorphous metal. 4,549,679, Cl. 225-2.000.

Waukee Engineering Company: *See*—
Stenzel, Wallace I.; and Payne, Kenneth R., 4,550,314, Cl. 340-623.000.

Weber, Karl-Heinz: *See*—
Schneider, Claus; Walther, Gerhard; Weber, Karl-Heinz; Bechtel, Wolf D.; and Boke-Kuhn, Karin, 4,550,106, Cl. 514-212.000.

Weber, Larry F., to Interstate Electronics Corporation. MOSFET Sustainer circuit for an AC plasma display panel. 4,550,274, Cl. 315-169.400.

Weddell, Ronald P.: *See*—
Gowan, Norman H.; Petravicius, Stasys; Hernandez, Ignacio T.; Kuhlmann, Robert E.; Vande Walle, Donald R., Jr.; Weddell, Ronald P.; Gates, Joseph M.; Sitzwohl, Kenneth J.; Sands, Charles D.; Gwinn, Rick A.; and Peterman, Milton J., 4,549,664, Cl. 211-131.000.

Weder, Donald E.: *See*—
Weder, Erwin H.; Weder, Donald E.; and Weder, Herbert A., 4,549,908, Cl. 106-266.000.

Weder, Erwin H.; Weder, Donald E.; and Weder, Herbert A., to Highland Manufacturing & Sales Co. Composition for decorative grass. 4,549,908, Cl. 106-266.000.

Weder, Herbert A.: *See*—
Weder, Erwin H.; Weder, Donald E.; and Weder, Herbert A., 4,549,908, Cl. 106-266.000.

Weeke, Bent: *See*—
Skov, Per S.; Norn, Svend; and Weeke, Bent, 4,550,085, Cl. 436-98.000.

Wefer, John M.: *See*—
Paddock, Charles F.; and Wefer, John M., 4,550,138, Cl. 525-67.000.

Wein, Franz: *See*—
Kugler, Kurt; Lessmann-Mieske, Hans-Henning; and Wein, Franz, 4,550,285, Cl. 323-343.000.

Weinberg, Maurice: *See*—
Saintsbury, John A.; Sampath, Parthasarathy; and Weinberg, Maurice, 4,549,402, Cl. 60-738.000.

Weins, Janine J.; and Weins, Michael J. Acoustic testing of complex multiple segment structures. 4,549,437, Cl. 73-587.000.

Weins, Michael J.: *See*—
Weins, Janine J.; and Weins, Michael J., 4,549,437, Cl. 73-587.000.

Weiss, Richard: *See*—
Spielau, Paul; Fassbender, Helmut; and Weiss, Richard, 4,550,051, Cl. 428-285.000.

Weixel, Mark: *See*—
Travlos, Constantine M.; Henderson, James A.; and Weixel, Mark, 4,549,347, Cl. 29-749.000.

Welch, Stephen R.: *See*—
Ozmon, Laird M.; and Welch, Stephen R., 4,549,688, Cl. 229-1.50R.

Weller, Ronald W.; and Drope, Terrence H., to McCain Manufacturing Corporation. Signature machines. 4,549,730, Cl. 271-100.000.

Wellman, Donald C.; and Clark, William E., to Carrier Corporation. Variable volume multizone system. 4,549,601, Cl. 165-2.000.

Welter, Andre ; Leyck, Sigurd; and Etschenberg, Eugen, to A. Nattermann & Cie GmbH. Benzisoselenazolones and a process for the treatment of inflammatory diseases. 4,550,168, Cl. 546-270.000.

Wen, Maz. Automatic speed variating means for bicycle. 4,549,874, Cl. 474-69.000.

Wente, Claus-Heinrich: *See*—
Uhland, Eberhard; Dienst, Manfred; and Wente, Claus-Heinrich, 4,550,002, Cl. 264-40.100.

Werling, Kenneth H., to Scandinavian Farming Aktiebolag. Drum for separation of a bulk material. 4,549,660, Cl. 209-44.300.

Werner, Peter: *See*—
Horbelt, Michael; Schnurle, Hans; Strauss, Peter; and Werner, Peter, 4,549,519, Cl. 123-493.000.

Werth, Larry J.; and Paulson, Larry G., to Pattern Processing Technologies, Inc. Address sequencer for pattern processing system. 4,550,431, Cl. 382-1.000.

Wessing, Joseph C., Jr.: *See*—
Cohen, Alfred S.; and Wessing, Joseph C., Jr., 4,549,385, Cl. 52-742.000.

West, Burnell G., to Fairchild Camera and Instrument Corporation. Deskew circuit for automatic test equipment. 4,550,405, Cl. 371-1.000.

West, Gerald W., to Honeywell Inc. Voltage transient protection circuit for MOSFET power transistors. 4,550,359, Cl. 361-56.000.

West Industries, Inc.: *See*—
Bloch, Alf L.; and Tindall, Joseph H., 4,549,457, Cl. 83-582.000.

West, John D.; Trainor, James E.; and Karman, James D., to Manitowoc Company, Inc., The. Large plate arc welder. 4,550,244, Cl. 219-158.000.

Western Digital Corporation: *See*—
Chung, Randall; and Ambrosius, William, III, 4,550,391, Cl. 365-233.000.

Westinghouse Electric Corp.: *See*—
Bolin, Philip C.; Bowman, Gary K.; Ellis, Charles S.; Hopkins, Melvyn D.; and Kane, Richard E., 4,550,219, Cl. 174-21.00C.
Bukowski, James M.; Midock, Gary E.; and Walko, Ronald J., 4,550,380, Cl. 364-494.000.

Westland plc: *See*—
Vincent, Alan H., 4,549,850, Cl. 416-140.000.

Wetzel, Clifford C.; Wetzel, Gerald L.; and Wetzel, James C. Furnace construction. 4,549,490, Cl. 110-101.00R.

Wetzel, Gerald L.: *See*—
Wetzel, Clifford C.; Wetzel, Gerald L.; and Wetzel, James C., 4,549,490, Cl. 110-101.00R.

Wetzel, James C.: *See*—
Wetzel, Clifford C.; Wetzel, Gerald L.; and Wetzel, James C., 4,549,490, Cl. 110-101.00R.

Whelchel, Charles J.: *See*—
Glaser, David; and Whelchel, Charles J., 4,550,039, Cl. 428-13.000.

Whetstone, Albert L.; and Shaklee, Kerry L., to Display Interface Corp. Stylus mouse. 4,550,316, Cl. 340-710.000.

Whipple, Terry L.: *See*—
Caspari, Richard B.; Whipple, Terry L.; and Thimsen, James A., 4,549,540, Cl. 128-133.000.

Whirlpool Corporation: *See*—
Martin, William J.; Carr, Keith E.; and Peterson, Edward C., 4,549,328, Cl. 15-338.000.

White, Basil, to Twin Disc, Incorporated. Multi-speed reversible transmission of countershaft construction. 4,549,443, Cl. 74-360.000.

White, John F., to John Wyeth & Brother limited. Benzoquinolizines as α_2-adrenoceptor antagonists. 4,550,114, Cl. 514-294.000.

White, Robert W., to General Electric Company. Apparatus for assembling a dynamoelectric machine. 4,549,346, Cl. 29-736.000.

White, Taryn M.: *See*—
Hendrix, James E.; Daniels, John Y.; and White, Taryn M., 4,549,880, Cl. 8-115.520.

White, Thomas C. Myopia alleviation prosthesis. 4,549,529, Cl. 128-1.00R.

Whitman, Peter J.: *See*—
Frulla, Floro F.; Stuber, Fred A.; and Whitman, Peter J., 4,550,188, Cl. 560-24.000.

Wickens, Richard L.: *See*—
Leach, Robert L.; and Wickens, Richard L., 4,550,283, Cl. 322-48.000.

Wickwire, Ralph O.: *See*—
Bass, Leland J.; Shah, Ashwin V.; and Wickwire, Ralph O., 4,550,315, Cl. 340-703.000.

Widman, Bruno. Piercing tool for manipulating the closures of beverage containers. 4,549,451, Cl. 81-3.470.

Wiechert, Rudolf: *See*—
Hofmeister, Helmut; Schulze, Paul E.; Annen, Klaus; Laurent, Henry; and Wiechert, Rudolf, 4,550,100, Cl. 514-179.000.

Wiegers, Wilhelmus J.; and Sprecker, Mark A., to International Flavors & Fragrances Inc. Process for preparing phenyl alkanol and perfumery uses of resulting product. 4,549,983, Cl. 252-522.00R.

Wight, Eleanor G.: *See*—
Lowin, Anne-Marie; and Wight, Eleanor G., 4,549,500, Cl. 116-240.000.

Wiiczek, Stephen P.: *See*—
Federico, Anthony M.; Legg, Ernest L.; Wiiczek, Stephen P.; Prasad, Hari K.; and Petery, James J., 4,550,382, Cl. 364-572.000.

Wilcke, Klaus-Dieter: *See*—
Becker, Dietmar; and Wilcke, Klaus-Dieter, 4,550,268, Cl. 310-239.000.

Wilden, James K.; and Tuck, Alan D., to Wilden Pump & Engineering Co. Actuator valve. 4,549,467, Cl. 91-307.000.

Wilden Pump & Engineering Co.: *See*—
Wilden, James K.; and Tuck, Alan D., 4,549,467, Cl. 91-307.000.

Wilkerson, Larry A., to American Seating Company. Transportation seat with vandal-resistant grabrail. 4,549,763, Cl. 297-183.000.

Wilkinson, Beverly L.: *See*—
Hampshire, James F.; and Wilkinson, Beverly L., 4,549,767, Cl. 297-439.000.

Willging, Stephen M., to Henkel Corporation. Purification of tocopherols. 4,550,183, Cl. 549-413.000.

Williams, Bruce E.: *See*—
Suh, John T.; Skiles, Jerry W.; Williams, Bruce E.; and Schwab, Alfred, 4,549,992, Cl. 260-455.00R.

Williams, David: *See*—
Stonestreet, Paul R.; Williams, David; Anderson, Kenneth; and Butcher, Peter J. L., 4,550,411, Cl. 373-134.000.

Willmann, Egon: *See*—
Volz, Hartwig; and Willmann, Egon, 4,549,813, Cl. 366-160.000.

Wilsey, Harvey J. Method of making a graphite zig-zag picket heater. 4,549,345, Cl. 29-611.000.

Wilson, Peter G., to Baker Perkins Holdings PLC. Form-fill-seal wrapping apparatus. 4,549,386, Cl. 53-51.000.

Winchell, David F., to AT&T Bell Laboratories. Method and apparatus for adding conferees to a conference. 4,550,224, Cl. 179-18.0BC.

Wing, Thomas W. Linear motor massage apparatus. 4,549,535, Cl. 128-55.000.

Winter, Arthur J., to W. Haking Enterprises Limited. Automatic focussing camera with automatic aperture setting. 4,549,801, Cl. 354-403.000.

Winter, Arthur J.; and Larson, Rodney L., to Databar Corporation. Optical scanning reader system for loading computers. 4,550,247, Cl. 235-472.000.

Wise, John J.: *See*—
Garwood, William E.; Kuo, James C.; Jacob, Solomon M.; and Wise, John J., 4,549,396, Cl. 60-39.020.

Wisebaker, Robert E.; and Edmondson, Richard, to National Machinery Company, The. Forging machine transfer with misalignment detector. 4,549,425, Cl. 72-422.000.

Wittkampf, Frederik H. M.; and Boute, Willem, to Vitafin N.V. Pacemaker system with automatic event-programmed switching between unipolar and bipolar operation. 4,549,548, Cl. 128-419.0PG.

Wittwer, Fritz: *See*—
Van Herle, Louis; and Wittwer, Fritz, 4,550,238, Cl. 219-121.0LC.

Wolf, Michael A.: *See*—
Waechter, David A.; Wolf, Michael A.; and Umbarger, C. John, 4,550,381, Cl. 364-527.000.

Wolfe, William R., Jr., to Du Pont de Nemours, E. I., and Company. Lamination of fluorocarbon films. 4,549,921, Cl. 156-272.600.

Wolff, Robin K.: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Wolff, Robin K.; Boden, Richard M.; and Yoshida, Takao, 4,549,971, Cl. 252-8.600.

Wood Manufacturing Co.: *See*—
Stone, Wayne B., Jr., 4,550,027, Cl. 426-433.000.

Woodall, Jerry M.: *See*—
Binnig, Gerd K.; Feenstra, Randall M.; Hodgson, Rodney T.; Rohrer, Heinrich; and Woodall, Jerry M., 4,550,257, Cl. 250-492.200.
Jackson, Thomas N.; Kirchner, Peter D.; Pettit, George D.; Rosenberg, James J.; Woodall, Jerry M.; and Wright, Steven L., 4,550,047, Cl. 428-136.000.

Woodbridge, J. Eliot; Bulbenko, George F.; and Marshall, J. John, to Electro-Nucleonics, Inc. β-Amylase determination. 4,550,077, Cl. 435-22.000.

Woodruff, Robert W.: *See*—
Neiss, Melvin A.; and Woodruff, Robert W., 4,550,073, Cl. 430-273.000.

Woodward, Robert E.; and Bickel, Hans, to Ciba-Geigy Corporation. Process for the manufacture of enol derivatives. 4,550,162, Cl. 544-016.000.

Wotton, David E. M.: *See*—
Sargent, Colin R.; Brierley, Keith; Wotton, David E. M.; and Coe, Paul L., 4,549,686, Cl. 228-242.000.

Woznicki, Michael: *See*—
Crowley, George C.; Carlson, Gordon S.; and Woznicki, Michael, 4,550,358, Cl. 361-42.000.

Wright, Dolph D., to General Motors Corporation. Pressure compensated fluid flow regulator. 4,549,572, Cl. 137-495.000.

Wright, Steven L.: *See*—
Jackson, Thomas N.; Kirchner, Peter D.; Pettit, George D.; Rosenberg, James J.; Woodall, Jerry M.; and Wright, Steven L., 4,550,047, Cl. 428-136.000.

Wunsch, Werner: *See*—
Gneiss, Heinz; Sumal, Jaihind S.; and Wunsch, Werner, 4,549,433, Cl. 73-204.000.

Wurz, Dieter: *See*—
Ernst, Gunter; Baer, Edmund; Wurz, Dieter; and Dittrich, Hans, 4,549,999, Cl. 261-109.000.
Wyatt, Leonard F.: *See*—
Turner, Jonathan S.; and Wyatt, Leonard F., 4,550,397, Cl. 370-60.000.
Wyskott, Bernd; Prange, Rainer; Moller, Kurt; and Fleischer, Joachim, to Dolomitwerke GmbH. Basic fire resistant material and shaped bodies therefrom. 4,549,906, Cl. 106-16.000.
Xerox Corporation: *See*—
Braun, Oskar J.; Hubler, Lawrence C.; and Sisson, Jeffrey L., 4,549,804, Cl. 355-14.0SH.
Federico, Anthony M.; Legg, Ernest L.; Wiiczek, Stephen P.; Prasad, Hari K.; and Petery, James J., 4,550,382, Cl. 364-572.000.
Ridder, Robert A.; and Tramontana, Joseph C., 4,550,333, Cl. 357-81.000.
Zomorrodi, Mehrdad; Cheung, Li-Fung; and Law, Simon M. L., 4,550,254, Cl. 250-338.000.
Yaginuma, Kenichi: *See*—
Matsumiya, Saburo; Uehara, Katsuya; Saito, Keiji; Michiki, Hideyuki; and Yaginuma, Kenichi, 4,549,904, Cl. 75-7.000.
Yahagi, Mitsuhisa; Masunaga, Mikio; Watanabe, Shuichi; and Tanaka, Tsutomu, to Bridgestone Tire Company Limited. Pneumatic tires. 4,549,593, Cl. 152-330.00R.
Yakich, Sam S. Blood pump improvements. 4,549,860, Cl. 417-475.000.
Yamada, Hideaki; Otsuji, Shogo; Isobe, Kimiyasu; Matsunaga, Kuniyoshi; and Inukai, Tadahiko, to Amano Seiyaku Kabushiki Kaisha. Method for the quantitative determination of individual polyamine components in a mixture. 4,550,078, Cl. 435-25.000.
Yamada, Junichi: *See*—
Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Junichi; and Ukigai, Toshiyuki, 4,549,607, Cl. 166-274.000.
Yamagami, Kazuo: *See*—
Endo, Mitsushi; Taniguchi, Toshiaki; Sahara, Teruyoshi; Hayakawa, Noriyuki; Yoshitomi, Tatsuo; Takahashi, Kozo; Nagatani, Yoshiteru; Kawai, Hidenao; Kaizyo, Shuichi; Nakagawa, Yoichi; Yamagami, Kazuo; Takizawa, Teruo; and Suzuki, Tomio, 4,549,472, Cl. 98-34.600.
Yamaguchi, Hisashi; Asano, Toru; Takahara, Kazuhiro; Kurahashi, Keizo; and Andoh, Shizuo, to Fujitsu Limited. Touch sensing device. 4,550,310, Cl. 340-365.00C.
Yamaguchi, Satoru: *See*—
Takahaski, Hitoshi; Yamaguchi, Satoru; and Nunokawa, Hideo, 4,550,264, Cl. 307-264.000.
Yamaguchi, Shunzo; Atsumi, Morihiro; and Fukazawa, Takeshi, to Nippondenso Co., Ltd. Ceramic heater. 4,549,905, Cl. 75-238.000.
Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Fujimoto, Hiroaki, 4,549,508, Cl. 123-73.0PP.
Iida, Kazumi; and Ikeda, Kenji, 4,549,869, Cl. 440-84.000.
Yamamoto, Akira: *See*—
Shirai, Mitsuru; Fukuda, Nobuo; Yamamoto, Akira; and Tsuji, Hiroshi, 4,549,603, Cl. 165-104.330.
Yamamoto, Kunio; Ichikawa, Kaoru; and Moriguchi, Seki, to Hitachi Koki Company, Ltd. Power-driven tacker with safety device. 4,549,681, Cl. 227-8.000.
Yamamoto, Shoii, to Kabushiki Kaisha Myotoku. Vacuum generating device. 4,549,854, Cl. 417-187.000.
Yamamoto, Tadashi: *See*—
Imai, Masafumi; Yamamoto, Tadashi; Furuhashi, Hiroyuki; Ueno, Hiroshi; and Inaba, Naomi, 4,550,095, Cl. 502-119.000.
Yamanaka, Kimio, to Mitsubishi Denki Kabushiki Kaisha. Control device. 4,550,278, Cl. 318-632.000.
Yamashita, Kyouichi, to Koyo Jidoki Co., Ltd. Method for cutting and supplying labels of various shapes. 4,549,454, Cl. 83-27.000.
Yamatani, Tetsuo: *See*—
Takemoto, Tadashi; Hijiya, Toyoto; and Yamatani, Tetsuo, 4,550,180, Cl. 549-253.000.
Yamauchi, Yasuhisa; Asano, Masao; and Arai, Mitsutaka, to Konishiroku Photo Industry Co., Ltd. Magnetic recording medium. 4,550,054, Cl. 428-328.000.
Yamawaki, Takashi: *See*—
Tanaka, Kenji; Sugawara, Akinobu; and Yamawaki, Takashi, 4,550,143, Cl. 525-240.000.
Yamazaki, Shiro: *See*—
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizu, Susumu; Watanabe, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,549,902, Cl. 71-90.000.
Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Refining process of reactive gas for forming semiconductor layer. 4,549,889, Cl. 62-11.000.
Yanagisawa, Syozo: *See*—
Usui, Toshifumi; and Yanagisawa, Syozo, 4,549,399, Cl. 60-286.000.
Yanagishima, Takayuki; Kasai, Junichi; Ajimine, Akio; Watanabe, Tatsuya; Shino, Akimitsu; and Murakami, Yoshiaki, to Nissan Motor Company, Limited; and Clarion Co. Ltd. Driver unit for automotive audio speaker. 4,550,428, Cl. 381-86.000.
Yasui Sangyo Co., Ltd.: *See*—
Masui, Saburo, 4,549,423, Cl. 72-295.000.
Yats, Larry D., to Dow Chemical Company, The. Aqueous slurry process for preparing reinforced polymeric composites. 4,550,131, Cl. 524-35.000.
Yazaki, Susumu; and Nagano, Jun, to Bridgestone Tire Company Limited. Apparatus for cutting out an edge portion of a coating sheet. 4,549,453, Cl. 83-365.000.
Yeakey, Ernest L.; and Sanderson, John R., to Texaco Inc. Production of 2-hydroxymethyl-1,3-dioxolane. 4,550,184, Cl. 549-453.000.
Yeh, An-I: *See*—
Berg, Lloyd; and Yeh, An-I, 4,549,938, Cl. 203-51.000.
Yen, Shiao-Ping S.; Carter, Boyd J.; Shen, David H.; and Somoano, Robert B., to California Institute of Technology. High cycle life secondary lithium battery. 4,550,064, Cl. 429-94.000.
Yogo, Kenji, to Aisin Seiki Kabushiki Kaisha. Pneumatic actuator. 4,549,470, Cl. 92-94.000.
Yokotani, Noboru: *See*—
Minekane, Tomiharu; Yokotani, Noboru; and Onuma, Takehiko, 4,549,809, Cl. 356-436.000.
Yoon, Jong B. Head-band holder for eyeglasses. 4,549,793, Cl. 351-156.000.
Yoshida, Kazutoshi: *See*—
Toyooka, Takashi; Yoshida, Kazutoshi; Ishida, Kazuhiro; Okahashi, Tatsuo; Aoki, Hirokazu; Suzuki, Ryo; and Sugita, Yutaka, 4,550,388, Cl. 365-6.000.
Yoshida Kogyo K. K.: *See*—
Toishi, Yoshiyuki, 4,549,348, Cl. 29-767.000.
Yoshida, Takao: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Wolff, Robin K.; Boden, Richard M.; and Yoshida, Takao, 4,549,971, Cl. 252-8.600.
Yoshihara, Kenji: *See*—
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; and Yoshihara, Kenji, 4,550,393, Cl. 369-32.000.
Yoshitomi, Tatsuo: *See*—
Endo, Mitsushi; Taniguchi, Toshiaki; Sahara, Teruyoshi; Hayakawa, Noriyuki; Yoshitomi, Tatsuo; Takahashi, Kozo; Nagatani, Yoshiteru; Kawai, Hidenao; Kaizyo, Shuichi; Nakagawa, Yoichi; Yamagami, Kazuo; Takizawa, Teruo; and Suzuki, Tomio, 4,549,472, Cl. 98-34.600.
Young, Donald C.: *See*—
Watkins, David R.; Knight, Robert K.; Young, Donald C.; and Kalfayan, Leonard J., 4,549,609, Cl. 166-303.000.
Yuan, Fumin: *See*—
Gable, Melvin G.; Sherman, Richard H.; and Yuan, Fumin, 4,550,402, Cl. 370-85.000.
Yuill, William A.: *See*—
Armstrong, Raynor O.; Norrgran, Daniel A.; and Yuill, William A., 4,549,959, Cl. 209-167.000.
Yukawa, Tomio: *See*—
Toyama, Fumiyasu; Murakoshi, Masaaki; Wakuda, Masanori; Sasaki, Junichi; Watanabe, Hirotoshi; Yukawa, Tomio; and Okayama, Yoshihiko, 4,550,366, Cl. 364-136.000.
Yurchenco, James R.: *See*—
Fish, Russell, III; and Yurchenco, James R., 4,549,825, Cl. 400-692.000.
Zabolotny, Dmitry I.: *See*—
Gjulling, Eduard V.; Djugovskaya, Larisa A.; Zabolotny, Dmitry I.; Kovtun, Jury P.; Liptuga, Nikolai I.; Litus, Viktor I.; Sambur, Marina B.; Romanov, Nikolai N.; Tolmachev, Alexei I.; Kirsanov, Alexandr V.; Pisanko, Viktor N.; Melnikov, Oleg F.; and Klochkov, Evgeny I., 4,550,170, Cl. 548-154.000.
Zagorski, Joseph B.; and Roy, Stephen C. Leg exercise device. 4,549,534, Cl. 128-25.00R.
Zakharova, Nina I.: *See*—
Lavretskaya, Elionora F.; Rudzit, Ernest A.; Piruzian, Lev A.; Volkova, Ljubov I.; Zakharova, Nina I.; Sarkisian, David A.; Upadysheva, Alexandra V.; Grigorieva, Natalya D.; Znamenskaya, Anna P.; Libinzon, Rakhil E.; and Antonian, Semen G., 4,550,113, Cl. 514-290.000.
Zandona, Oliver J.: *See*—
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Hettinger, William P., Jr.; Kovach, Stephen M.; Palmer, James L.; and Zandona, Oliver J., 4,549,958, Cl. 208-253.000.
Zellweger Uster Ltd.: *See*—
Murbach, Erwin; and Peter, Jean, 4,549,428, Cl. 73-32.00R.
Zichy, Theodore B. R. Precharged containers. 4,549,389, Cl. 53-471.000.
Zielke, Terry L.: *See*—
Davis, John E.; Zielke, Terry L.; and Coash, Ronald J., 4,549,694, Cl. 239-710.000.
Ziemecki, Stanislaw B.: *See*—
Mabry, Melinda A.; Prichard, William W.; and Ziemecki, Stanislaw B., 4,550,185, Cl. 549-508.000.
Zimmer, Inc.: *See*—
Schadrack, William C., III; McQueen, Robert W.; and Eyerly, Joyce K., 4,549,538, Cl. 128-92.0EB.
Ziolko, Francis J., to Devro, Inc. Apparatus for preparing sausage links. 4,549,330, Cl. 17-34.000.
Zitelli, Louis T.; and Schumacher, Richard T., to Varian Associates, Inc. Image intensifier tube with increased contrast ratio. 4,550,251, Cl. 250-213.0VT.
Znamenskaya, Anna P.: *See*—
Lavretskaya, Elionora F.; Rudzit, Ernest A.; Piruzian, Lev A.; Volkova, Ljubov I.; Zakharova, Nina I.; Sarkisian, David A.; Upadysheva, Alexandra V.; Grigorieva, Natalya D.; Znamenskaya, Anna P.; Libinzon, Rakhil E.; and Antonian, Semen G., 4,550,113, Cl. 514-290.000.
Zomorrodi, Mehrdad; Cheung, Li-Fung; and Law, Simon M. L., to Xerox Corporation. Low cost infrared reflectance densitometer signal processor chip. 4,550,254, Cl. 250-338.000.
Zondler, Helmut: *See*—
Stockinger, Friedrich; Lohse, Friedrich; and Zondler, Helmut, 4,550,203, Cl. 564-105.000.
Zorini, Luigi O.; and Zorzoli, Walter, to Comez S.p.A. Knitting machine to produce figured fabrics. 4,549,414, Cl. 66-203.000.
Zorzoli, Walter: *See*—
Zorini, Luigi O.; and Zorzoli, Walter, 4,549,414, Cl. 66-203.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF OCTOBER, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aument, Patrick E.: *See*—
de la Burde, Roger Z.; and Aument, Patrick E., Re. 32,013, Cl. 131-291.000.
Sykes, Larry M.; Snow, Ray G.; de la Burde, Roger Z.; and Aument, Patrick E., Re. 32,014, Cl. 131-291.000.

de la Burde, Roger Z.; and Aument, Patrick E., to Philip Morris, Inc. Expanding tobacco. Re. 32,013, Cl. 131-291.000.

de la Burde, Roger Z.: *See*—
Sykes, Larry M.; Snow, Ray G.; de la Burde, Roger Z.; and Aument, Patrick E., Re. 32,014, Cl. 131-291.000.

Eastman Kodak Company: *See*—
Esders, Theodore W.; Goodhue, Charles T.; and Schubert, Richard M., Re. 32,016, Cl. 435-28.000.

Esders, Theodore W.; Goodhue, Charles T.; and Schubert, Richard M., to Eastman Kodak Company. Analysis of lactic acid or lactate using lactate oxidase. Re. 32,016, Cl. 435-28.000.

Geiger, Rolf; and Obermeier, Rainer, to Hoechst Aktiengesellschaft. Process for the manufacture of insulin, analogs and derivatives thereof. Re. 32,015, Cl. 260-112.700.

Goodhue, Charles T.: *See*—
Esders, Theodore W.; Goodhue, Charles T.; and Schubert, Richard M., Re. 32,016, Cl. 435-28.000.

Hoechst Aktiengesellschaft: *See*—
Geiger, Rolf; and Obermeier, Rainer, Re. 32,015, Cl. 260-112.700.

Obermeier, Rainer: *See*—
Geiger, Rolf; and Obermeier, Rainer, Re. 32,015, Cl. 260-112.700.

Philip Morris, Inc.: *See*—
de la Burde, Roger Z.; and Aument, Patrick E., Re. 32,013, Cl. 131-291.000.
Sykes, Larry M.; Snow, Ray G.; de la Burde, Roger Z.; and Aument, Patrick E., Re. 32,014, Cl. 131-291.000.

Schubert, Richard M.: *See*—
Esders, Theodore W.; Goodhue, Charles T.; and Schubert, Richard M., Re. 32,016, Cl. 435-28.000.

Snow, Ray G.: *See*—
Sykes, Larry M.; Snow, Ray G.; de la Burde, Roger Z.; and Aument, Patrick E., Re. 32,014, Cl. 131-291.000.

Sykes, Larry M.; Snow, Ray G.; de la Burde, Roger Z.; and Aument, Patrick E., to Philip Morris, Inc. Process for expanding tobacco. Re. 32,014, Cl. 131-291.000.

LIST OF DESIGN PATENTEES

Airpax Corporation: *See*—
Harper, George S., 281,156, Cl. D13-34.000.

American Tourister, Inc.: *See*—
Bomes, Harvey; Pulichino, John; Barber, Jack; and Migliore, John, 281,122, Cl. D3-71.000.

Artwick, Kert E., to Leslie-Locke, Inc. Self-closing ventilation louver. 281,194, 10-29-85, Cl. D23-151.000.

Astolfi, Pietro, to Pico-Glass S.p.A. Picture frame hanger. 281,144, 10-29-85, Cl. D8-373.000.

AT&T Information Systems: *See*—
Chan, Eric P. P.; Galloway, Ronny N.; Johnson, Chris G.; and Sylvester, Gordon E., 281,160, Cl. D14-52.000.

ATL Pty. Limited: *See*—
Mitchell, Neville A., 281,175, Cl. D20-2.000.

Barber, Jack: *See*—
Bomes, Harvey; Pulichino, John; Barber, Jack; and Migliore, John, 281,122, Cl. D3-71.000.

Bayerische Motoren Werke Aktiengesellschaft: *See*—
Luthe, Claus; and Boyer, Boyke, 281,152, Cl. D12-167.000.
Luthe, Claus; and Boyer, Boyke, 281,153, Cl. D12-169.000.
Luthe, Claus; and Boyer, Boyke, 281,154, Cl. D12-169.000.

BBC International, Ltd.: *See*—
Campbell, Robert B.; and Landau, Junichi P., 281,115, Cl. D2-309.000.

Berkey Photo, Inc.: *See*—
Rejwan, Sasson, 281,124, Cl. D6-470.000.

Bio-Temp Products, Inc.: *See*—
Khemka, Kailash C., 281,147, Cl. D10-57.000.

Bloom, David R. Color matching card. 281,173, 10-29-85, Cl. D19-37.000.

Blue Box Toy Factory Pte. Ltd.: *See*—
Ng, Cheuk S., 281,180, Cl. D21-105.000.

Bomes, Harvey; Pulichino, John; Barber, Jack; and Migliore, John, to American Tourister, Inc. Soft-sided luggage. 281,122, 10-29-85, Cl. D3-71.000.

Boyer, Boyke: *See*—
Luthe, Claus; and Boyer, Boyke, 281,152, Cl. D12-167.000.
Luthe, Claus; and Boyer, Boyke, 281,153, Cl. D12-169.000.
Luthe, Claus; and Boyer, Boyke, 281,154, Cl. D12-169.000.

Braathen, Thor F. Stepper chassis for terrain-going vehicles. 281,165, 10-29-85, Cl. D15-33.000.

Braathen, Thor F. Stepper chassis for terrain going vehicles. 281,166, 10-29-85, Cl. D15-33.000.

Brockenshire, Joseph M. Card table. 281,178, 10-29-85, Cl. D21-37.000.

Brown, Richard G., to Null Manufacturing Corporation. Table. 281,125, 10-29-85, Cl. D6-477.000.

Butler, Craig R.; and Scott, Ede. Record album opener. 281,141, 10-29-85, Cl. D8-98.000.

Campbell, Robert B.; and Landau, Junichi P., to BBC International, Ltd. Sport shoe. 281,115, 10-29-85, Cl. D2-309.000.

Catlett, Doyle, to Starsearch, Ltd. Mobile antenna transport trailer. 281,150, 10-29-85, Cl. D12-101.000.

CBS Inc.: *See*—
Tilbor, Neil, 281,177, Cl. D21-17.000.

Cesaroni, William C., to Dart Industries Inc. Apparatus for popping corn. 281,137, 10-29-85, Cl. D7-325.000.

Chan, Eric P. P.; Galloway, Ronny N.; Johnson, Chris G.; and Sylvester, Gordon E., to AT&T Information Systems. Communication apparatus enclosure. 281,160, 10-29-85, Cl. D14-52.000.

Chapman, Glen D. Toilet seat for infants. 281,193, 10-29-85, Cl. D23-53.000.

Clenod A/S: *See*—
Krogh, Kell, 281,149, Cl. D11-41.000.

Clover Manufacturing Co., Ltd.: *See*—
Gakiya, Yoshiaki, 281,118, Cl. D3-26.000.

Colquitt, Simone, to Syracuse China Corporation. Plate or similar article. 281,126, 10-29-85, Cl. D7-32.000.

Colquitt, Simone, to Syracuse China Corporation. Plate or similar article. 281,129, 10-29-85, Cl. D7-33.000.

Colquitt, Simone, to Syracuse China Corporation. Decal for a plate or similar article. 281,133, 10-29-85, Cl. D7-39.000.

Colquitt, Simone, to Syracuse China Corporation. Decal for a plate or similar article. 281,134, 10-29-85, Cl. D7-39.000.

Cunliffe, Stephen E., to Ocean Trends. Key holder. 281,121, 10-29-85, Cl. D3-62.000.

Dart Industries Inc.: *See*—
Cesaroni, William C., 281,137, Cl. D7-325.000.

DeRoyal Industries, Inc.: *See*—
Hillier, Arthur R., 281,169, Cl. D15-146.000.

Donaldson Company, Inc.: *See*—
Robinson, Edgar A., 281,163, Cl. D14-109.000.

Envoys U.S.A. Inc.: *See*—
Gamm, Robert J., 281,117, Cl. D2-309.000.

Frassanito, John R., to Sani-Fresh International, Inc. Cleaning device. 281,123, 10-29-85, Cl. D4-114.000.

Frates, Paul S.: *See*—
Scholl, Charles H.; and Frates, Paul S., 281,168, Cl. D15-144.000.

Fujii, Hiroshi; Moritani, Hiroshi; Iwahashi, Wataru; and Sugiyama, Masakazu, to Sharp Corporation. Microwave oven. 281,138, 10-29-85, Cl. D7-351.000.

Fujii, Hiroshi; Moritani, Hiroshi; Sugiyama, Masakazu; and Iwahashi, Wataru, to Sharp Corporation. Microwave oven. 281,139, 10-29-85, Cl. D7-351.000.

Fujii, Takashi: *See*—
Takahashi, Akira; Itou, Fumitaka; Kiyota, Toru; Fujii, Takashi; and Kawaguchi, Mitsuo, 281,162, Cl. D14-82.000.

Gakiya, Yoshiaki, to Clover Manufacturing Co., Ltd. Stitch holder. 281,118, 10-29-85, Cl. D3-26.000.

Galloway, Ronny N.: *See*—
Chan, Eric P. P.; Galloway, Ronny N.; Johnson, Chris G.; and Sylvester, Gordon E., 281,160, Cl. D14-52.000.

Gamm, Robert J., to Kangaroos. Pocketed athletic shoe upper. 281,116, 10-29-85, Cl. D2-309.000.

Gamm, Robert J., to Envoys U.S.A. Inc. Athletic shoe with pocket cover flap. 281,117, 10-29-85, Cl. D2-309.000.
Gentex Corporation: *See*—
Stevens, Philip H., 281,159, Cl. D14-37.000.
Grabovac, Bosko. Readout unit for torque tools. 281,143, 10-29-85, Cl. D8-24.000.
Hansen, David L. Aquatic exercise tank. 281,198, 10-29-85, Cl. D24-38.000.
Hara, Kunio; and Okuyama, Tooru, to Tokyo Shibaura Denki Kabushiki Kaisha. Original feeder for copying machine. 281,170, 10-29-85, Cl. D16-32.000.
Harper, George S., to Airpax Corporation. Circuit breaker. 281,156, 10-29-85, Cl. D13-34.000.
Highstreet, Rebecca A.; Shield, Raymond G.; and Jensen, Nancy A., to Signet Scientific Co. Digital depth meter. 281,148, 10-29-85, Cl. D10-70.000.
Hillier, Arthur R., to DeRoyal Industries, Inc. Combined roller and impulse heat sealing apparatus. 281,169, 10-29-85, Cl. D15-146.000.
Hiraishi, Etsuo; and Shohoji, Takeshi, to Ryobi Ltd. Fishing reel. 281,189, 10-29-85, Cl. D22-25.000.
Hitachi, Ltd.: *See*—
Takahashi, Akira; Itou, Fumitaka; Kiyota, Toru; Fujii, Takashi; and Kawaguchi, Mitsuo, 281,162, Cl. D14-82.000.
Holewinski, Robert D., to J&J Dental Products Company. Packaging container for dental materials. 281,146, 10-29-85, Cl. D9-345.000.
Interleco A.G.: *See*—
Knudsen, Jens N., 281,181, Cl. D21-108.000.
Ishizaki, Hideaki, to Pioneer Electronic Corporation. Loudspeaker. 281,158, 10-29-85, Cl. D14-34.000.
Itou, Fumitaka: *See*—
Takahashi, Akira; Itou, Fumitaka; Kiyota, Toru; Fujii, Takashi; and Kawaguchi, Mitsuo, 281,162, Cl. D14-82.000.
Iwahashi, Wataru: *See*—
Fujii, Hiroshi; Moritani, Hiroshi; Iwahashi, Wataru; and Sugiyama, Masakazu, 281,138, Cl. D7-351.000.
Fujii, Hiroshi; Moritani, Hiroshi; Sugiyama, Masakazu; and Iwahashi, Wataru, 281,139, Cl. D7-351.000.
J&J Dental Products Company: *See*—
Holewinski, Robert D., 281,146, Cl. D9-345.000.
Jagger, Vivienne D., to Little People Limited. Spoon. 281,135, 10-29-85, Cl. D7-150.000.
Jensen, Nancy A.: *See*—
Highstreet, Rebecca A.; Shield, Raymond G.; and Jensen, Nancy A., 281,148, Cl. D10-70.000.
Johnson, Chris G.: *See*—
Chan, Eric P. P.; Galloway, Ronny N.; Johnson, Chris G.; and Sylvester, Gordon E., 281,160, Cl. D14-52.000.
Kalkus, Mark P. Backpack cooler with moulded back frame and seat. 281,119, 10-29-85, Cl. D3-32.000.
Kanamaru, Yutaka: *See*—
Shohoji, Takeshi; and Kanamaru, Yutaka, 281,188, Cl. D22-25.000.
Kanaoki, Shinichi: *See*—
Weiland, Herbert C.; and Kanaoki, Shinichi, 281,179, Cl. D21-59.000.
Kangaroos: *See*—
Gamm, Robert J., 281,116, Cl. D2-309.000.
Kato, Yuji; and Nuttall, Michael W., to Tomy Kogyo Company, Incorporated. Toy construction piece. 281,182, 10-29-85, Cl. D21-108.000.
Kato, Yuji; and Nuttall, Michael W., to Tomy Kogyo Company, Inc. Toy construction piece. 281,183, 10-29-85, Cl. D21-108.000.
Kato, Yuji; and Nuttall, Michael W., to Tomy Kogyo Company, Incorporated. Toy construction piece. 281,184, 10-29-85, Cl. D21-108.000.
Kato, Yuji; and Nuttall, Michael W., to Tomy Kogyo Company, Incorporated. Toy construction piece. 281,185, 10-29-85, Cl. D21-108.000.
Kato, Yuji; and Nuttall, Michael W., to Tomy Kogyo Company, Incorporated. Toy construction piece. 281,186, 10-29-85, Cl. D21-108.000.
Kawaguchi, Mitsuo: *See*—
Takahashi, Akira; Itou, Fumitaka; Kiyota, Toru; Fujii, Takashi; and Kawaguchi, Mitsuo, 281,162, Cl. D14-82.000.
Kawata, Yoshiaki: *See*—
Uematsu, Toyoyuki; Kawata, Yoshiaki; Mano, Kazunori; and Tsubaki, Hiroyuki, 281,161, Cl. D14-80.000.
Khemka, Kailash C., to Bio-Temp Products, Inc. Thermochromic finger thermometer. 281,147, 10-29-85, Cl. D10-57.000.
Kim, Syng N., to Wico Corporation. Mouse. 281,164, 10-29-85, Cl. D14-114.000.
Kitai, Isao; and Yamada, Kazuo, to Sharp Corporation. Calculator. 281,172, 10-29-85, Cl. D18-7.000.
Kiyota, Toru: *See*—
Takahashi, Akira; Itou, Fumitaka; Kiyota, Toru; Fujii, Takashi; and Kawaguchi, Mitsuo, 281,162, Cl. D14-82.000.
Knight, Leland W., to Omaco Enterprises, Inc. Pulse rate monitor console. 281,196, 10-29-85, Cl. D24-17.000.
Knudsen, Jens N., to Interleco A.G. Toy construction piece. 281,181, 10-29-85, Cl. D21-108.000.
Krogh, Kell, to Clenod A/S. Earring. 281,149, 10-29-85, Cl. D11-41.000.
Kurz, Craven H. Orthodontic utility plier. 281,195, 10-29-85, Cl. D24-10.000.
Landau, Junichi P.: *See*—
Campbell, Robert B.; and Landau, Junichi P., 281,115, Cl. D2-309.000.
Leslie-Locke, Inc.: *See*—
Artwick, Kert E., 281,194, Cl. D23-151.000.
Little People Limited: *See*—
Jagger, Vivienne D., 281,135, Cl. D7-150.000.
Luthe, Claus; and Boyer, Boyke, to Bayerische Motoren Werke Aktiengesellschaft. Elastomer bumper corner guard for automobile. 281,152, 10-29-85, Cl. D12-167.000.
Luthe, Claus; and Boyer, Boyke, to Bayerische Motoren Werke Aktiengesellschaft. Rear bumper for automobile. 281,153, 10-29-85, Cl. D12-169.000.
Luthe, Claus; and Boyer, Boyke, to Bayerische Motoren Werke Aktiengesellschaft. Front bumper for automobile. 281,154, 10-29-85, Cl. D12-169.000.
Mahoney, Richard F.; and Swartz, Kenneth L. Tethered pen and holder therefor. 281,174, 10-29-85, Cl. D19-75.000.
Mano, Kazunori: *See*—
Uematsu, Toyoyuki; Kawata, Yoshiaki; Mano, Kazunori; and Tsubaki, Hiroyuki, 281,161, Cl. D14-80.000.
Marx, Hubert J., Jr. Fishing spoon. 281,191, 10-29-85, Cl. D22-29.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Uematsu, Toyoyuki; Kawata, Yoshiaki; Mano, Kazunori; and Tsubaki, Hiroyuki, 281,161, Cl. D14-80.000.
Migliore, John: *See*—
Bomes, Harvey; Pulichino, John; Barber, Jack; and Migliore, John, 281,122, Cl. D3-71.000.
Mitchell, Neville A., to ATL Pty. Limited. Self-service betting machine. 281,175, 10-29-85, Cl. D20-2.000.
Moe, Kjell. Pillbox. 281,145, 10-29-85, Cl. D9-341.000.
Moritani, Hiroshi: *See*—
Fujii, Hiroshi; Moritani, Hiroshi; Iwahashi, Wataru; and Sugiyama, Masakazu, 281,138, Cl. D7-351.000.
Fujii, Hiroshi; Moritani, Hiroshi; Sugiyama, Masakazu; and Iwahashi, Wataru, 281,139, Cl. D7-351.000.
Myers, Carl J.; and Teufel, Rainer B., to Warner & Swasey Company, The. Turning machine. 281,167, 10-29-85, Cl. D15-130.000.
Nappe Babcock Co.: *See*—
Rabinowitz, Harold, 281,120, Cl. D3-42.000.
Ng, Cheuk S., to Blue Box Toy Factory Pte. Ltd. Toy puzzle. 281,180, 10-29-85, Cl. D21-105.000.
Nordson Corporation: *See*—
Scholl, Charles H.; and Frates, Paul S., 281,168, Cl. D15-144.000.
Null Manufacturing Corporation: *See*—
Brown, Richard G., 281,125, Cl. D6-477.000.
Nuttall, Michael W.: *See*—
Kato, Yuji; and Nuttall, Michael W., 281,182, Cl. D21-108.000.
Kato, Yuji; and Nuttall, Michael W., 281,183, Cl. D21-108.000.
Kato, Yuji; and Nuttall, Michael W., 281,184, Cl. D21-108.000.
Kato, Yuji; and Nuttall, Michael W., 281,185, Cl. D21-108.000.
Kato, Yuji; and Nuttall, Michael W., 281,186, Cl. D21-108.000.
Ocean Trends: *See*—
Cunliffe, Stephen E., 281,121, Cl. D3-62.000.
Okuyama, Tooru: *See*—
Hara, Kunio; and Okuyama, Tooru, 281,170, Cl. D16-32.000.
Omaco Enterprises, Inc.: *See*—
Knight, Leland W., 281,196, Cl. D24-17.000.
Pico-Glass S.p.A.: *See*—
Astolfi, Pietro, 281,144, Cl. D8-373.000.
Pioneer Electronic Corporation: *See*—
Ishizaki, Hideaki, 281,158, Cl. D14-34.000.
Takagi, You, 281,157, Cl. D14-30.000.
Poque, Dionysius J.; and Zinnen, Norbert, to Uniroyal Englebert Reifen GmbH. Tire. 281,151, 10-29-85, Cl. D12-147.000.
Prawl, William F. Safety stand for use in association with hydraulic lift. 281,199, 10-29-85, Cl. D34-28.000.
Pulichino, John: *See*—
Bomes, Harvey; Pulichino, John; Barber, Jack; and Migliore, John, 281,122, Cl. D3-71.000.
Rabinowitz, Harold, to Nappe Babcock Co. Tote bag with double strap. 281,120, 10-29-85, Cl. D3-42.000.
Rejwan, Sasson, to Berkey Photo, Inc. Photographic album storage and display case. 281,124, 10-29-85, Cl. D6-470.000.
Robinson, Edgar A., to Donaldson Company, Inc. Filter for a computer disk drive assembly. 281,163, 10-29-85, Cl. D14-109.000.
Rubinetterie Stella S.p.A.: *See*—
Santi, Carlo, 281,192, Cl. D23-35.000.
Ryobi Ltd.: *See*—
Hiraishi, Etsuo; and Shohoji, Takeshi, 281,189, Cl. D22-25.000.
Shohoji, Takeshi; and Kanamaru, Yutaka, 281,188, Cl. D22-25.000.
Sahota, Harvinder. Hemostat. 281,197, 10-29-85, Cl. D24-17.000.
Sakai Co., Ltd.: *See*—
Sakai, Keikichi, 281,190, Cl. D22-25.000.
Sakai, Keikichi, to Sakai Co., Ltd. Fishing reel. 281,190, 10-29-85, Cl. D22-25.000.
Sakata, Keiji: *See*—
Yamagami, Masafumi; and Sakata, Keiji, 281,171, Cl. D18-7.000.
Sani-Fresh International, Inc.: *See*—
Frassanito, John R., 281,123, Cl. D4-114.000.
Santi, Carlo, to Rubinetterie Stella S.p.A. Shower head. 281,192, 10-29-85, Cl. D23-35.000.
Scholl, Charles H.; and Frates, Paul S., to Nordson Corporation. Automatic fluid dispenser module for hot melt adhesive or the like. 281,168, 10-29-85, Cl. D15-144.000.
Scott, Ede: *See*—
Butler, Craig R.; and Scott, Ede, 281,141, Cl. D8-98.000.
Scura, Brian, to Scura Speed & Tech, Incorporated. Tool for adjusting bicycle brakes. 281,140, 10-29-85, Cl. D8-71.000.
Scura, Brian, to Scura Speed & Tech, Incorporated. Bicycle hub. 281,155, 10-29-85, Cl. D12-207.000.
Scura Speed & Tech, Incorporated: *See*—
Scura, Brian, 281,140, Cl. D8-71.000.

Scura, Brian, 281,155, Cl. D12-207.000.
Sharp Corporation: *See*—
Fujii, Hiroshi; Moritani, Hiroshi; Iwahashi, Wataru; and Sugiyama, Masakazu, 281,138, Cl. D7-351.000.
Fujii, Hiroshi; Moritani, Hiroshi; Sugiyama, Masakazu; and Iwahashi, Wataru, 281,139, Cl. D7-351.000.
Kitai, Isao; and Yamada, Kazuo, 281,172, Cl. D18-7.000.
Yamagami, Masafumi; and Sakata, Keiji, 281,171, Cl. D18-7.000.
Shield, Raymond G.: *See*—
Highstreet, Rebecca A.; Shield, Raymond G.; and Jensen, Nancy A., 281,148, Cl. D10-70.000.
Shohoji, Takeshi; and Kanamaru, Yutaka, to Ryobi Ltd. Fishing reel. 281,188, 10-29-85, Cl. D22-25.000.
Shohoji, Takeshi: *See*—
Hiraishi, Etsuo; and Shohoji, Takeshi, 281,189, Cl. D22-25.000.
Signet Scientific Co.: *See*—
Highstreet, Rebecca A.; Shield, Raymond G.; and Jensen, Nancy A., 281,148, Cl. D10-70.000.
Starsearch, Ltd.: *See*—
Catlett, Doyle, 281,150, Cl. D12-101.000.
Stevens, Philip H., to Gentex Corporation. Sound-attenuating earcups. 281,159, 10-29-85, Cl. D14-37.000.
Sugiyama, Masakazu: *See*—
Fujii, Hiroshi; Moritani, Hiroshi; Iwahashi, Wataru; and Sugiyama, Masakazu, 281,138, Cl. D7-351.000.
Fujii, Hiroshi; Moritani, Hiroshi; Sugiyama, Masakazu; and Iwahashi, Wataru, 281,139, Cl. D7-351.000.
Sukovich, Suzanne B. Monitor board for pill-taking schedule. 281,176, 10-29-85, Cl. D20-18.000.
Swartz, Kenneth L.: *See*—
Mahoney, Richard F.; and Swartz, Kenneth L., 281,174, Cl. D19-75.000.
Sylvester, Gordon E.: *See*—
Chan, Eric P. P.; Galloway, Ronny N.; Johnson, Chris G.; and Sylvester, Gordon E., 281,160, Cl. D14-52.000.
Syracuse China Corporation: *See*—
Colquitt, Simone, 281,126, Cl. D7-32.000.
Colquitt, Simone, 281,129, Cl. D7-33.000.
Colquitt, Simone, 281,133, Cl. D7-39.000.
Colquitt, Simone, 281,134, Cl. D7-39.000.
Unger, Steve A., 281,127, Cl. D7-33.000.
Unger, Steve A., 281,128, Cl. D7-33.000.
Unger, Steve A., 281,130, Cl. D7-36.000.
Unger, Steve A., 281,131, Cl. D7-36.000.
Unger, Steve A., 281,132, Cl. D7-39.000.
Takagi, You, to Pioneer Electronic Corporation. Loudspeaker. 281,157, 10-29-85, Cl. D14-30.000.
Takahashi, Akira; Itou, Fumitaka; Kiyota, Toru; Fujii, Takashi; and Kawaguchi, Mitsuo, to Hitachi, Ltd. Television receiver. 281,162, 10-29-85, Cl. D14-82.000.
Teufel, Rainer B.: *See*—
Myers, Carl J.; and Teufel, Rainer B., 281,167, Cl. D15-130.000.
Tilbor, Neil, to CBS Inc. Game board. 281,177, 10-29-85, Cl. D21-17.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Hara, Kunio; and Okuyama, Tooru, 281,170, Cl. D16-32.000.
Tomy Kogyo Company, Incorporated: *See*—
Kato, Yuji; and Nuttall, Michael W., 281,182, Cl. D21-108.000.
Kato, Yuji; and Nuttall, Michael W., 281,183, Cl. D21-108.000.
Kato, Yuji; and Nuttall, Michael W., 281,184, Cl. D21-108.000.
Kato, Yuji; and Nuttall, Michael W., 281,185, Cl. D21-108.000.
Kato, Yuji; and Nuttall, Michael W., 281,186, Cl. D21-108.000.
Weiland, Herbert C.; and Kanaoki, Shinichi, 281,179, Cl. D21-59.000.
Tsubaki, Hiroyuki: *See*—
Uematsu, Toyoyuki; Kawata, Yoshiaki; Mano, Kazunori; and Tsubaki, Hiroyuki, 281,161, Cl. D14-80.000.
Uematsu, Toyoyuki; Kawata, Yoshiaki; Mano, Kazunori; and Tsubaki, Hiroyuki, to Matsushita Electric Industrial Co., Ltd. Television receiver. 281,161, 10-29-85, Cl. D14-80.000.
Unger, Steve A., to Syracuse China Corporation. Plate or similar article. 281,127, 10-29-85, Cl. D7-33.000.
Unger, Steve A., to Syracuse China Corporation. Plate or similar article. 281,128, 10-29-85, Cl. D7-33.000.
Unger, Steve A., to Syracuse China Corporation. Plate or similar article. 281,130, 10-29-85, Cl. D7-36.000.
Unger, Steve A., to Syracuse China Corporation. Plate or similar article. 281,131, 10-29-85, Cl. D7-36.000.
Unger, Steve A., to Syracuse China Corporation. Decal for a plate or similar article. 281,132, 10-29-85, Cl. D7-39.000.
Uniroyal Englebert Reifen GmbH: *See*—
Poque, Dionysius J.; and Zinnen, Norbert, 281,151, Cl. D12-147.000.
Wallace, Robert S. Picture frame bowed clip. 281,142, 10-29-85, Cl. D8-349.000.
Warner & Swasey Company, The: *See*—
Myers, Carl J.; and Teufel, Rainer B., 281,167, Cl. D15-130.000.
Wei, Yung-Kuan. Beverage dispenser or the like. 281,136, 10-29-85, Cl. D7-301.000.
Weiland, Herbert C.; and Kanaoki, Shinichi, to Tomy Kogyo Company, Incorporated. Viewing toy. 281,179, 10-29-85, Cl. D21-59.000.
Wico Corporation: *See*—
Kim, Syng N., 281,164, Cl. D14-114.000.
Wiese, James A. Clamp element for model railroad coupler. 281,187, 10-29-85, Cl. D21-141.000.
Yamada, Kazuo: *See*—
Kitai, Isao; and Yamada, Kazuo, 281,172, Cl. D18-7.000.
Yamagami, Masafumi; and Sakata, Keiji, to Sharp Corporation. Electronic calculator. 281,171, 10-29-85, Cl. D18-7.000.
Zinnen, Norbert: *See*—
Poque, Dionysius J.; and Zinnen, Norbert, 281,151, Cl. D12-147.000.

LIST OF PLANT PATENTEES

Jackson & Perkins Company: *See*—
Warriner, William A., 5,577, Cl. 8.000.
Warriner, William A., 5,578, Cl. 9.000.
Warriner, William A., to Jackson & Perkins Company. Rose plant Jacsmi. 5,577, 10-29-85, Cl. 8.000.
Warriner, William A., to Jackson & Perkins Company. Rose plant Jacouch. 5,578, 10-29-85, Cl. 9.000.

CLASSIFICATION OF PATENTS

ISSUED OCTOBER 29, 1985

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

2 4,549,315
195 4,549,316
237 4,549,317

CLASS 4

301 4,549,321

CLASS 5

2 R 4,549,320
93 B 4,549,322
455 4,549,323

CLASS 7

142 4,549,324

CLASS 8

115.52 4,549,880

CLASS 10

86 R 4,549,325

CLASS 15

84 4,549,326
236 R 4,549,327
338 4,549,328
353 4,549,329

CLASS 17

34 4,549,330

CLASS 24

92 4,549,331
335 4,549,332

CLASS 28

205 4,549,333

CLASS 29

3 4,549,342
33 M 4,549,343
278 4,549,334
432 4,549,344
527.4 4,549,337
527.6 4,549,339
569 L 4,549,338
571 4,549,340
576 B 4,549,336
598 4,549,341
611 4,549,345
736 4,549,346
749 4,549,347
767 4,549,348
866 4,549,335

CLASS 30

41.5 4,549,352
92 4,549,349
170 4,549,350
293 4,549,351

CLASS 33

125 R 4,549,353
125 T 4,549,354
148 H 4,549,355
169 R 4,549,356
293 4,549,360
508 4,549,357
516 4,549,359
560 4,549,358

CLASS 34

17 4,549,361
31 4,549,362
216 4,549,363

CLASS 37

197 4,549,364
251 4,549,365

CLASS 38

102.2 4,549,366

CLASS 43

88 4,549,367
4,549,368

CLASS 44

51 4,549,881
53 4,549,882
57 4,549,883
4,549,884
4,549,885

CLASS 48

197 R 4,549,886

CLASS 49

279 4,549,369

CLASS 51

7 4,549,370
170 MT 4,549,371
206 R 4,549,372
241 A 4,549,373
283 R 4,549,374

CLASS 52

39 4,549,375
94 4,549,376
4,549,377
169.12 4,549,378
200 4,549,379
240 4,549,380
337 4,549,381
506 4,549,382
667 4,549,383
704 4,549,384
742 4,549,385

CLASS 53

51 4,549,386
469 4,549,387
471 4,549,389
556 4,549,388

CLASS 55

131 4,549,887
163 4,549,888

CLASS 56

13.6 4,549,390

CLASS 57

13 4,549,391
22 4,549,392
58.36 4,549,393
58.57 4,549,394
340 4,549,395

CLASS 60

39.02 4,549,396
39.3 4,549,397
286 4,549,398
4,549,399
394 4,549,400
652 4,549,401
738 4,549,402

CLASS 62

11 4,549,889
18 4,549,890
201 4,549,403
224 4,549,404
239 4,549,405
241 4,549,406
304 4,549,407
320 4,549,408
381 4,549,409
457 4,549,410

CLASS 63

2 4,549,411

CLASS 65

3.12 4,549,891
21.4 4,549,892
28 4,549,893
30.11 4,549,894
134 4,549,895
135 4,549,896

CLASS 66

149 R 4,549,412
163 4,549,413
203 4,549,414

CLASS 68

158 4,549,415

CLASS 69

10 4,549,416

CLASS 70

18 4,549,417
85 4,549,418

CLASS 71

3 4,549,897
90 4,549,898
4,549,899
4,549,902
92 4,549,900
94 4,549,901
116 4,549,903

CLASS 72

4 4,549,419
41 4,549,420
4,549,421
131 4,549,422
295 4,549,423
329 4,549,424
422 4,549,425

CLASS 73

3 4,549,426
23 4,549,427
32 R 4,549,428
40 4,549,429
115 4,549,430
151 4,549,431
200 4,549,432
204 4,549,433
299 4,549,434
505 4,549,435
517 A 4,549,436
587 4,549,437
862.21 4,549,438
862.65 4,549,439
863.85 4,549,440

CLASS 74

10.33 4,549,441
110 4,549,442
360 4,549,443
411.5 4,549,444
579 R 4,549,445
625 4,549,446
689 4,549,447
710.5 4,549,448
785 4,549,449
805 4,549,450

CLASS 75

7 4,549,904
238 4,549,905

CLASS 81

3.47 4,549,451

CLASS 83

27 4,549,454
42 4,549,458
100 4,549,452
365 4,549,453
477.2 4,549,455
478 4,549,456
582 4,549,457

CLASS 84

1.01 4,549,459
298 4,549,460
313 4,549,461
413 4,549,462

CLASS 86

36 4,549,463

CLASS 89

1.809 4,549,464
196 4,549,465

CLASS 91

6.5 4,549,466
307 4,549,467
361 4,549,468

CLASS 92

5 R 4,549,469
94 4,549,470

CLASS 98

2.09 4,549,471
34.6 4,549,472
67 4,549,473
120 4,549,474
122 4,549,475

CLASS 99

352 4,549,476
477 4,549,477
536 4,549,478
625 4,549,479

CLASS 100

88 4,549,480
98 R 4,549,481
191 4,549,482

CLASS 101

45 4,549,483
123 4,549,484
219 4,549,485

CLASS 102

334 4,549,486
498 4,549,487
503 4,549,488
505 4,549,489

CLASS 106

16 4,549,906
208 4,549,907
266 4,549,908

CLASS 110

101 R 4,549,490

CLASS 112

73 4,549,491
76 4,549,492
79.5 4,549,496
121.15 4,549,493
266.1 4,549,494
315 4,549,495

CLASS 114

36 4,549,497
145 A 4,549,498
244 4,549,499

CLASS 116

240 4,549,500

CLASS 119

99 4,549,501
158 4,549,502

CLASS 122

479 R 4,549,503

CLASS 123

41.01 4,549,504
41.08 4,549,505
52 MB 4,549,506
59 B 4,549,507
73 PP 4,549,508
90.16 4,549,509
90.27 4,549,510
263 4,549,511
339 4,549,512
425 4,549,513
4,549,514
452 4,549,515
478 4,549,516
4,549,517
4,549,518
493 4,549,519
572 4,549,520

CLASS 124

5 4,549,521

CLASS 126

72 4,549,522
97 4,549,523
289 4,549,524
361 4,549,525
367 4,549,526
374 4,549,527
438 4,549,528

CLASS 127

33 4,549,909

CLASS 128

1 R 4,549,529
4,549,530
4,549,531
1.3 4,549,532
24 A 4,549,533
25 R 4,549,534
55 4,549,535
60 4,549,536
87 A 4,549,537
92 EB 4,549,538
132 R 4,549,539
133 4,549,540
201.19 4,549,541
201.24 4,549,542
206.12 4,549,543
335 4,549,544
4,549,545
419 F 4,549,546
4,549,547
419 PG 4,549,548
680 4,549,549
686 4,549,550
689 4,549,551
700 4,549,552
719 4,549,553
753 4,549,554
782 4,549,555
785 4,549,556
4,549,557

CLASS 131

202 4,549,558
291 Re.32,013
Re.32,014

CLASS 132

11 R 4,549,559
37 R 4,549,560

CLASS 133

3 A 4,549,561

CLASS 134

138 4,549,562

CLASS 137

71 4,549,565
100 4,549,563
110 4,549,564
117 4,549,566
262 4,549,567
382 4,549,568
382.5 4,549,569
389 4,549,570
489.5 4,549,571
495 4,549,572
4,549,573
565 4,549,574
614.03 4,549,575
614.04 4,549,576
4,549,577
624.11 4,549,578
625.21 4,549,579

CLASS 138

89 4,549,580
109 4,549,581

CLASS 139

430 4,549,582

CLASS 140

92.1 4,549,583

CLASS 141

73 4,549,584
95 4,549,585

CLASS 144

3 R 4,549,586
209 R 4,549,587
356 4,549,588

CLASS 148

6.27 4,549,910
16 4,549,911
33 4,549,913
33.1 4,549,912
187 4,549,914

CLASS 150

52 J 4,549,589

CLASS 152

41 4,549,590
218 4,549,591
328 4,549,592
330 R 4,549,593
359 4,549,594

CLASS 156

78 4,549,915
93 4,549,916
108 4,549,917
160 4,549,918
172 4,549,919
181 4,549,920
272.6 4,549,921
293 4,549,922
423 4,549,923
470 4,549,924
506 4,549,925
612 4,549,926
643 4,549,927
660 4,549,928

CLASS 157

1 4,549,595

CLASS 160

374.1 4,549,596

CLASS 162

78 4,549,929
134 4,549,930
145 4,549,931
207 4,549,932
281 4,549,933

CLASS 164

35 4,549,597
66.1 4,549,598
122.1 4,549,599
323 4,549,600

CLASS 165

2 4,549,601
80.2 4,549,602
104.33 4,549,603
110 4,549,604
150 4,549,605
179 4,549,606

CLASS 166

274 4,549,607
280 4,549,608
303 4,549,609

CLASS 172

3 4,549,610
158 4,550,122
375 4,549,611

CLASS 174

21 C 4,550,219
138 F 4,550,220

CLASS 175

20 4,549,612
325 4,549,613
339 4,549,614
389 4,549,615
394 4,549,616

CLASS 177

1 4,549,617
25 4,549,618
4,549,619
60 4,549,620
105 4,549,621
134 4,549,622
212 4,549,623

CLASS 178

18 4,550,221

CLASS 179

1.5 R 4,550,222
18 BC 4,550,224
81 R 4,550,225
4,550,226
107 E 4,550,227
115 V 4,550,228
115.5 H 4,550,229
175.3 F 4,550,223
178 4,550,230

CLASS 180

6.28 4,549,624
90 4,549,625
127 4,549,626
142 4,549,627
143 4,549,628
219 4,549,629

CLASS 181

106 4,549,630
155 4,549,631

CLASS 182

23 4,549,632

135 4,549,633
179 4,549,634
187 4,549,635

CLASS 188

71.4 4,549,636

CLASS 191

23 A 4,550,231

CLASS 192

0.094 4,549,640
3.63 4,549,637
45 4,549,638
48.91 4,549,639
106.2 4,549,641
4,549,642
111 A 4,549,643

CLASS 196

14.52 4,549,935
98 4,549,934

CLASS 198

341 4,549,644
408 4,549,645
409 4,549,646
461 4,549,647
509 4,549,648

CLASS 200

16 A 4,550,232
61.62 4,550,233
144 B 4,550,234

CLASS 202

167 4,549,936

CLASS 203

40 4,549,937
51 4,549,938

CLASS 204

4 4,549,939
13 4,549,940
27 4,549,941
40 4,549,942
96 4,549,943
129.1 4,549,944
159.11 4,549,945
182.4 4,549,946
4,549,947
196 4,549,948
197 4,549,949
206 4,549,950
416 4,549,951
4,549,952
419 4,549,953

CLASS 206

63.3 4,549,649
179 4,549,650
329 4,549,651
363 4,549,652
441 4,549,653
486 4,549,654
569 4,549,655
589 4,549,656
610 4,549,657
614 4,549,658

CLASS 208

8 LE 4,549,954
59 4,549,955
120 4,549,956
216 PP 4,549,957
253 4,549,958

CLASS 209

3.2 4,549,659
44.3 4,549,660
167 4,549,959
240 4,549,960
534 4,549,661
539 4,549,662

CLASS 210

108 4,549,961
150 4,549,962
314 4,549,963
369 4,549,964
635 4,549,965
661 4,549,966
728 4,549,967
750 4,549,968
759 4,549,969
776 4,549,970

CLASS 211

13 4,549,663
131 4,549,664
191 4,549,665

CLASS 213

62 A 4,549,666

CLASS 215

252 4,549,667

CLASS 219

76.14 4,550,235
86.31 4,550,236
121 LC 4,550,238
121 LD 4,550,237
121 LG 4,550,241
121 LS 4,550,240
121 PG 4,550,239
4,550,242
158 4,550,244
216 4,550,243
405 4,550,245

CLASS 220

203 4,549,668
306 4,549,669
338 4,549,670
344 4,549,671
441 4,549,672
465 4,549,673

CLASS 222

48 4,549,674
129.1 4,549,675
145 4,549,676
591 4,549,677

CLASS 225

2 4,549,678
4,549,679

CLASS 226

76 4,549,680
142 4,549,683

CLASS 227

8 4,549,681
119 4,549,682

CLASS 228

110 4,549,684
118 4,549,685
242 4,549,686
263.18 4,549,687

CLASS 229

1.5 R 4,549,688
17 S 4,549,689
41 C 4,549,690

CLASS 235

385 4,550,246
472 4,550,247
492 4,550,248

CLASS 236

58 4,549,691

CLASS 237

12.3 A 4,549,692

CLASS 239

58 4,549,693
265.35 4,549,695
452 4,549,696
681 4,549,697
710 4,549,694

CLASS 241

17 4,549,698
91 4,549,699

CLASS 242

56 R 4,549,700
75.3 4,549,701
84.51 A 4,549,702
84.52 B 4,549,703
107 4,549,704
107.4 R 4,549,705

CLASS 244

1 R 4,549,706
3.21 4,549,707
129.4 4,549,708

CLASS 248

56 4,549,709
183 4,549,710
188 4,549,711
224.4 4,549,712
349 4,549,714
495 4,549,713

CLASS 250

201 4,550,249
203 R 4,550,250
213 VT 4,550,251
223 R 4,550,252
326 4,550,253
338 4,550,254
359.1 4,550,255
483.1 4,550,256
492.2 4,550,257

CLASS 251

29 4,549,715
96 4,549,716
111 4,549,717
121 4,549,718
280 4,549,719

CLASS 252

8.55 R 4,549,973
8.6 4,549,971
4,549,972
33.6 4,549,974
49.6 4,549,975
49.8 4,549,976
90 4,549,977
109 4,549,978
135 4,549,979
301.23 4,549,980
518 4,549,981
522 R 4,549,982
4,549,983
532 4,549,984
631 4,549,985

CLASS 254

124 4,549,720
126 4,549,721
134 4,549,722
405 4,549,723

CLASS 256

12.5 4,549,724

CLASS 260

112.5 R 4,549,987
112.5 T 4,549,986
112.7 Re.32,015
239 BB 4,549,988
378 4,549,989
397.25 4,549,990
453 PH 4,549,991
455 R 4,549,992
505.1 4,550,258
543 R 4,549,993
544 F 4,549,994
973 4,549,995

CLASS 261

19 4,549,996
77 4,549,997
88 4,549,998
109 4,549,999
114 R 4,550,000

CLASS 264

2.6 4,550,001
40.1 4,550,002
53 4,550,003
63 4,550,004
177 R 4,550,005
328.2 4,550,006
521 4,550,007
527 4,550,008
529 4,550,009

CLASS 266

58 4,549,725

CLASS 267

140.5 4,549,726

CLASS 269

70 4,549,727

CLASS 270

46 4,549,728
53 4,549,729

CLASS 271

100 4,549,730
107 4,549,731

CLASS 272

70 4,549,732
118 4,549,733
134 4,549,734

CLASS 273

9 4,549,735
67 R 4,549,736
118 R 4,549,737
148 A 4,549,738
248 4,549,739

CLASS 277

189 4,549,740
236 4,549,741

CLASS 280

11.18 4,549,742
47.13 R 4,549,743
415 A 4,549,744
434 4,549,745
446 B 4,549,746
446 R 4,549,747
641 4,549,748
808 4,549,749

CLASS 283

79 4,549,750

CLASS 285

30 4,549,751
55 4,549,752
95 4,549,753
334 4,549,754
341 4,549,755
388 4,549,756

CLASS 290

55 4,550,259

CLASS 293

120 4,549,757

CLASS 294

19.2 4,549,758
67.2 4,549,759
88 4,549,760

CLASS 296

206 4,549,761
208 4,549,762

CLASS 297

183 4,549,763
296 4,549,764
311 4,549,765
396 4,549,766
439 4,549,767
468 4,549,768
479 4,549,770
483 4,549,769

CLASS 307

106 4,550,260
118 4,550,261
260 4,550,262
261 4,550,263
264 4,550,264
494 4,550,265

CLASS 308

3 R 4,549,771
3.8 4,549,773
4,549,774
6 C 4,549,772

CLASS 310

19 4,550,266
184 4,550,267
239 4,550,268

CLASS 312

15 4,549,775
111 4,549,776
198 4,549,777

CLASS 313

331 4,550,269
579 4,550,270

CLASS 315

4 4,550,271
86 4,550,272
151 4,550,273
169.4 4,550,274
241 R 4,550,275
312 4,550,276

CLASS 318

334 4,550,277
632 4,550,278
696 4,550,279
701 4,550,280
723 4,550,281
808 4,550,282

CLASS 322

48 4,550,283

CLASS 323

315 4,550,284
343 4,550,285

CLASS 324

51 4,550,286
73 R 4,550,287
133 4,550,288
158 R 4,550,289

CLASS 330

149 4,550,290
277 4,550,291

CLASS 331

2 4,550,292
116 R 4,550,293

CLASS 332

7.51 4,550,294

CLASS 333

19 4,550,295
26 4,550,296
99 MP 4,550,297

CLASS 335

16 4,550,300
35 4,550,298
195 4,550,299
228 4,550,302

CLASS 338

20 4,550,301

CLASS 339

40 4,549,778
58 4,549,779
107 4,549,780

CLASS 340

80 4,550,303
84 4,550,304
134 4,550,305
310 R 4,550,306
347 AD 4,550,309
347 DA 4,550,307
347 NT 4,550,308
365 C 4,550,310
531 4,550,311
539 4,550,312
584 4,550,313
623 4,550,314
703 4,550,315
710 4,550,316
995 4,550,317

CLASS 343

5 PD 4,550,318
882 4,550,319

CLASS 346

75 4,550,320
4,550,321
4,550,322
4,550,323
76 PH 4,550,324
140 R 4,550,325
4,550,326
4,550,327
201 4,550,328
214 4,550,329

CLASS 350

96.16 4,549,782
96.20 4,549,783
96.27 4,549,784
96.30 4,549,781
140 4,549,785
315 4,549,787
354 4,549,788
358 4,549,789
624 4,549,790
625 4,549,786
632 4,549,791

CLASS 351

63 4,549,792
156 4,549,793
161 4,549,794
163 4,549,795

CLASS 352

133 4,549,796

CLASS 353

27 A 4,549,797
72 4,549,798

CLASS 354

400 4,549,799
4,549,800
403 4,549,801
4,549,802

CLASS 355

3 R 4,550,334
3 SH 4,549,805
14 FU 4,549,803
14 SH 4,549,804

CLASS 356

318 4,549,807
350 4,549,806
374 4,549,808
436 4,549,809

CLASS 357

16 4,550,330
24 4,550,331
38 4,550,332
81 4,550,333

CLASS 358

11 4,550,335
4,550,336
13 4,550,337
20 4,550,338
28 4,550,339
31 4,550,340
114 4,550,341
153 4,550,342
229 4,550,343
248 4,550,344
323 4,550,345
330 4,550,346
338 4,550,347
342 4,550,348

CLASS 360

10.2 4,550,349
15 4,550,350
77 4,550,351
109 4,550,352
125 4,550,353
133 4,550,354
4,550,355

CLASS 361

9 4,550,356
42 4,550,358
56 4,550,359
93 4,550,360
295 4,550,361
398 4,550,357
415 4,550,362

CLASS 362

806 4,550,363

CLASS 363

24 4,550,364
98 4,550,365

CLASS 364

136 4,550,366
200 4,550,367
4,550,368
4,550,369
413 4,550,370
414 4,550,371
426 4,550,372
431.04 4,550,373
471 4,550,377
474 4,550,375
4,550,378
490 4,550,374
494 4,550,379
4,550,380
512 4,550,376
513 4,550,383
527 4,550,381
556 4,550,384
558 4,550,385
572 4,550,382
900 4,550,386
4,550,387

CLASS 365

6 4,550,388
37 4,550,389
174 4,550,390
233 4,550,391

CLASS 366

75 4,549,810
129 4,549,811
142 4,549,812
160 4,549,813

CLASS 367

82 4,550,392

CLASS 369

32 4,550,393
46 4,550,394
103 4,550,395
284 4,550,396

CLASS 370

60 4,550,397
66 4,550,398
80 4,550,399
85 4,550,400
4,550,401
4,550,402
110.1 4,550,403
4,550,404

CLASS 371

1 4,550,405
20 4,550,406
29 4,550,407

CLASS 372

58 4,550,408
59 4,550,409
97 4,550,410

CLASS 373

108 4,550,413
134 4,550,411
155 4,550,412

CLASS 374

2 4,549,814
8 4,549,815
27 4,549,816
152 4,549,817
178 4,549,818
4,549,819

CLASS 375

1 4,550,414
14 4,550,415
59 4,550,416

CLASS 377
10 4,550,417
17 4,550,418

CLASS 378
099 4,550,419
171 4,550,420
196 4,550,421
207 4,550,422

CLASS 381
13 4,550,423
15 4,550,424
30 4,550,425
46 4,550,426
70 4,550,427
86 4,550,428
90 4,550,429
96 4,550,430

CLASS 382
1 4,550,431
4,550,432
7 4,550,433
9 4,550,434
4,550,435
34 4,550,436
41 4,550,437
56 4,550,438

CLASS 383
8 4,550,439
33 4,550,440
103 4,550,441
113 4,550,442

CLASS 384
95 4,549,820
103 4,549,821
462 4,549,822
537 4,549,823

CLASS 400
241.1 4,549,824
692 4,549,825
708 4,549,826

CLASS 401
29 4,549,827
258 4,549,828

CLASS 403
57 4,549,829
134 4,549,830
231 4,549,831
264 4,549,832

CLASS 404
4 4,549 833
75 4,549,834

CLASS 405
4 4,549,835
61 4,549,836
101 4,549,837

CLASS 411
468 4,549,838

CLASS 414
7 4,549,839
24.5 4,549,840
282 4,549,841
391 4,549,842
416 4,549,843
534 4,549,844
620 4,549,845
729 4,549,846

CLASS 415
182 4,549,847
206 4,549,848
219 R 4,549,849

CLASS 416
140 4,549,850
4,549,851
4,549,852

CLASS 417
53 4,549,853
187 4,549,854
270 4,549,855
295 4,549,856
312 4,549,857
353 4,549,858
363 4,549,859
475 4,549,860

CLASS 418
55 4,549,861
133 4,549,862

CLASS 422
4 4,550,010
68 4,550,011
106 4,550,012
151 4,550,013

CLASS 423
289 4,550,014
445 4,550,015

CLASS 424
3 4,550,016
11 4,550,017
52 4,550,018
85 4,550,019
88 4,550,020
122 4,550,021
127 4,550,022

CLASS 425
126 R 4,549,863
145 4,549,864
342.1 4,549,865

CLASS 426
19 4,550,023
77 4,550,024
105 4,550,025
316 4,550,026
433 4,550,027
487 4,550,029
582 4,550,028

CLASS 427
2 4,550,030
10 4,550,031
64 4,550,032
222 4,550,033
243 4,550,034
398.1 4,550,035
443.1 4,550,036
4,550,037

CLASS 428
12 4,550,038
13 4,550,039
33 4,550,040
35 4,550,041
36 4,550,042
4,550,043
101 4,550,044
102 4,550,045
116 4,550,046
136 4,550,047
138 4,550,048
141 4,550,049
215 4,550,057
283 4,550,050
285 4,550,051
304.4 4,550,053
323 4,550,052
328 4,550,054
383 4,550,055
391 4,550,056
409 4,550,059
412 4,550,058
423.1 4,550,060
461 4,550,061
611 4,550,062
614 4,550,063

CLASS 429
94 4,550,064
105 4,550,065
191 4,550,066
213 4,550,067

CLASS 430
122 4,550,068
165 4,550,069
202 4,550,070
203 4,550,071
256 4,550,072
273 4,550,073
322 4,550,074

CLASS 432
10 4,549,866

CLASS 434
337 4,549,867

CLASS 435
7 4,550,075
18 4,550,076
22 4,550,077
25 4,550,078
28 Re.32,016
189 4,550,079
212 4,550,080
253 4,550,081

CLASS 436
24 4,550,082
42 4,550,083
45 4,550,084
98 4,550,085
506 4,550,086

CLASS 440
42 4,549,868
84 4,549,869

CLASS 441
41 4,549,870
81 4,549,871

CLASS 455
33 4,550,443
41 4,550,444

CLASS 464
141 4,549,872
4,549,873

CLASS 474
69 4,549,874

CLASS 493
49 4,549,875
169 4,549,876
204 4,549,877
334 4,549,878

CLASS 501
13 4,550,087
135 4,550,088
139 4,550,089

CLASS 502
25 4,550,090
62 4,550,091
71 4,550,092
107 4,550,093
110 4,550,094
119 4,550,095
166 4,550,096
170 4,550,097
324 4,550,098

CLASS 514
14 4,550,099
179 4,550,100
188 4,550,101
206 4,550,102
210 4,550,103
4,550,104
4,550,105
212 4,550,106
220 4,550,107
232 4,550,108
249 4,550,109
254 4,550,110
255 4,550,111
278 4,550,112
290 4,550,113
294 4,550,114
320 4,550,115
327 4,550,116
344 4,550,117
383 4,550,118
394 4,550,119
469 4,550,120
4,550,121

CLASS 521
64 4,550,123
85 4,550,124
117 4,550,125
159 4,550,126

CLASS 523
212 4,550,127
433 4,550,128
4,550,129
436 4,550,130

CLASS 524
35 4,550,131
84 4,550,132
399 4,550,133
413 4,550,134
495 4,550,135
718 4,550,136

CLASS 525
31 4,550,137
67 4,550,138
90 4,550,139
132 4,550,140
221 4,550,141
236 4,550,142
240 4,550,143
247 4,550,144
267 4,550,145
327.3 4,550,146
332.6 4,550,147
440 4,550,148

CLASS 526
68 4,550,149
233 4,550,150

CLASS 528
7 4,550,151
15 4,550,152
49 4,550,153
73 4,550,154
176 4,550,155
185 4,550,156
322 4,550,157

CLASS 534
605 4,550,158

CLASS 536
6.4 4,550,159
7.1 4,550,160
90 4,550,161

CLASS 544
016 4,550,162
244 4,550,163
291 4,550,164

CLASS 546
94 4,550,165
119 4,550,166
156 4,550,167
270 4,550,168

CLASS 548
108 4,550,169
154 4,550,170
159 4,550,171
180 4,550,172
262 4,550,173
306 4,550,174
341 4,550,175
343 4,550,176
413 4,550,177
426 4,550,178
571 4,550,179

CLASS 549
253 4,550,180
326 4,550,181
408 4,550,182
413 4,550,183
453 4,550,184
508 4,550,185

CLASS 556
8 4,550,186
137 4,550,187

CLASS 560
24 4,550,188
62 4,550,192
044 4,550,189
053 4,550,190
056 4,550,191
147 4,550,193
200 4,550,194
206 4,550,195
486 4,550,198

CLASS 562
418 4,550,196
460 4,550,197
556 4,550,199
4,550,200

CLASS 564
15 4,550,201
23 4,550,202
105 4,550,203
134 4,550,204
166 4,550,205
289 4,550,206
311 4,550,207
329 4,550,208
479 4,550,209

CLASS 568
33 4,550,210
361 4,550,211
401 4,550,212
458 4,550,213
643 4,550,214

CLASS 585
324 4,550,217
408 4,550,218
469 4,550,215
645 4,550,216

CLASS 604
247 4,549,879

CLASS 623
22 4,549,319
44 4,549,318

CLASSIFICATION OF DESIGNS

D2— 309 281,115
281,116
281,117
D3— 26 281,118
32 281,119
42 281,120
62 281,121
71 281,122
D4— 114 281,123
D6— 470 281,124
477 281,125
D7— 32 281,126
33 281,127
281,128
281,129
36 281,130
281,131
39 281,132
281,133
281,134
150 281,135
301 281,136
325 281,137
351 281,138
281,139
D8— 24 281,143
71 281,140
98 281,141
349 281,142
373 281,144
D9— 341 281,145
345 281,146
D10— 57 281,147
70 281,148
D11— 41 281,149
D12— 101 281,150
147 281,151
167 281,152
169 281,153
281,154
207 281,155
D13— 34 281,156
D14— 30 281,157
34 281,158
37 281,159
52 281,160
80 281,161
82 281,162
109 281,163
114 281,164
D15— 33 281,165
281,166
130 281,167
144 281,168
146 281,169
D16— 32 281,170
D18— 7 281,171
281,172
D19— 37 281,173
75 281,174
D20— 2 281,175
18 281,176
D21— 17 281,177
37 281,178
59 281,179
105 281,180
108 281,181
281,182
281,183
281,184
281,185
281,186
141 281,187
D22— 25 281,188
281,189
281,190
29 281,191
D23— 35 281,192
53 281,193
151 281,194
D24— 10 281,195
17 281,196
281,197
38 281,198
D34— 28 281,199

CLASSIFICATION OF PLANTS

P.— 8 5,577
9 5,578

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 4,549,319
4,549,327
4,549,486
4,549,567
4,550,220
4,550,226
04 : 4,549,612
4,549,713
4,549,795
4,549,811
4,549,918
4,550,291
4,550,305
05 : 4,549,573
4,549,959
06 : 4,549,334
4,549,341
4,549,350
4,549,351
4,549,369
4,549,397
4,549,405
4,549,435
4,549,436
4,549,438
4,549,459
4,549,460
4,549,462
4,549,467
4,549,475
4,549,477
4,549,535
4,549,541
4,549,571
4,549,589
4,549,602
4,549,609
4,549,624
4,549,651
4,549,664
4,549,669
4,549,676
4,549,707
4,549,718
4,549,738
4,549,739
4,549,743
4,549,758
4,549,773
4,549,775
4,549,801
4,549,825
4,549,843
4,549,860
4,549,876
4,549,886
4,549,901
4,549,985
4,549,986
4,550,017
4,550,036
4,550,044
4,550,046
4,550,064
4,550,081
4,550,121
4,550,129
4,550,192
4,550,197
4,550,247
4,550,251
4,550,254
4,550,255
4,550,297
4,550,301
4,550,315
4,550,326
4,550,331
4,550,333
4,550,355
4,550,368
4,550,374
4,550,389
4,550,391
4,550,392
4,550,405
4,550,406
4,550,424
4,550,436
4,550,440
08 : 4,549,695
4,549,917
4,550,230
4,550,350
09 : 4,549,329
4,549,363
4,549,495
4,549,509
4,549,562
4,549,599
4,549,708
4,549,748
4,549,845
4,549,852
4,549,941
4,549,950
4,549,992
4,550,041
4,550,059
4,550,063
4,550,066
4,550,138
4,550,157
4,550,164
4,550,188
4,550,300
4,550,316
4,550,360
4,550,410
4,550,441
10 : 4,549,921
4,550,141
4,550,185
12 : 4,549,338
4,549,444
4,549,528
4,549,530
4,549,534
4,549,554
4,549,556
4,549,614
4,549,838
4,549,868
4,550,429
13 : 4,549,496
4,550,198
16 : 4,549,463
17 : 4,549,325
4,549,344
4,549,346
4,549,362
4,549,377
4,549,383
4,549,417
4,549,443
4,549,451
4,549,484
4,549,533
4,549,536
4,549,552
4,549,654
4,549,656
4,549,670
4,549,688
4,549,689
4,549,697
4,549,712
4,549,722
4,549,725
4,549,730
4,549,746
4,549,756
4,549,764
4,549,794
4,549,823
4,549,861
4,549,883
4,549,908
4,549,967
4,550,039
4,550,091
4,550,098
4,550,163
4,550,224
4,550,233
4,550,241
4,550,267
4,550,274
4,550,288
4,550,358
4,550,362
4,550,376
4,550,400
4,550,401
4,550,426
4,550,443
18 : 4,549,368
4,549,446
4,549,449
4,549,521
4,549,643
4,549,666
4,549,735
4,549,909
4,549,957
4,550,055
4,550,339
19 : 4,549,409
4,549,429
4,549,448
4,549,458
4,549,501
4,549,577
4,549,744
4,549,834
20 : 4,549,316
4,549,482
4,549,699
4,549,853
21 : 4,549,388
4,549,418
4,549,473
4,549,595
4,549,644
4,549,958
22 : 4,549,385
4,549,455
4,549,527
4,549,633
4,549,682
4,549,796
4,549,837
4,549,882
4,549,885
4,549,973
4,550,167
24 : 4,549,347
4,549,381
4,549,434
4,549,745
4,549,751
4,550,027
4,550,271
4,550,277
4,550,293
4,550,318
4,550,342
4,550,438
25 : 4,549,450
4,549,465
4,549,590
4,549,620
4,549,631
4,549,657
4,549,740
4,549,891
4,549,933
4,549,939
4,549,953
4,550,058
4,550,086
4,550,123
4,550,155
4,550,156
4,550,162
4,550,214
4,550,228
4,550,270
4,550,325
4,550,414
26 : 4,549,328
4,549,364
4,549,440
4,549,457
4,549,490
4,549,504
4,549,506
4,549,543
4,549,572
4,549,575
4,549,684
4,549,733
4,549,749
4,549,761
4,549,763
4,549,769
4,549,770
4,549,774
4,549,844
4,549,942
4,549,965
4,549,979
4,550,103
4,550,104
4,550,119
4,550,125
4,550,131
4,550,154
4,550,194
4,550,201
4,550,261
4,550,286
4,550,320
4,550,395
4,550,402
27 : 4,549,526
4,549,585
4,549,675
4,549,706
4,549,715
4,549,750
4,549,870
4,549,936
4,549,951
4,549,960
4,550,031
4,550,183
4,550,221
4,550,250
4,550,361
4,550,370
4,550,425
4,550,431
28 : 4,549,494
29 : 4,549,378
4,549,729
4,549,734
4,549,737

4,550,397
30 : 4,549,365
4,549,938
31 : 4,549,680
4,549,694
4,550,122
33 : 4,549,315
4,549,437
4,549,719
4,550,043
4,550,068
4,550,415
34 : 4,549,330
4,549,360
4,549,375
4,549,396
4,549,545
4,549,649
4,549,653
4,549,687
4,549,693
4,549,731
4,549,741
4,549,779
4,549,782
4,549,788
4,549,807
4,549,815
4,549,907
4,549,911
4,549,926
4,549,940
4,549,955
4,549,956
4,549,971
4,549,972
4,549,974
4,549,975
4,549,976
4,549,977
4,549,982
4,549,983
4,549,988
4,550,012
4,550,034
4,550,035
4,550,038
4,550,069
4,550,073
4,550,074
4,550,077
4,550,092
4,550,093

4,550,120
4,550,126
4,550,140
4,550,150
4,550,153
4,550,160
4,550,190
4,550,193
4,550,217
4,550,218
4,550,225
4,550,249
4,550,256
4,550,283
4,550,319
4,550,335
4,550,336
4,550,337
4,550,340
4,550,351
4,550,377
4,550,404
4,550,427
4,550,430
4,550,432
4,550,435
35 : 4,550,014
4,550,273
4,550,275
4,550,381
36 : Re.32,016
4,549,321
4,549,374
4,549,403
4,549,404
4,549,407
4,549,500
4,549,569
4,549,601
4,549,605
4,549,658
4,549,673
4,549,685
4,549,690
4,549,732
4,549,752
4,549,755
4,549,781
4,549,791
4,549,804
4,549,824
4,549,857
4,549,866

4,549,884
4,549,893
4,549,894
4,549,912
4,549,927
4,549,928
4,549,931
4,549,952
4,550,006
4,550,047
4,550,056
4,550,061
4,550,087
4,550,128
4,550,152
4,550,166
4,550,169
4,550,187
4,550,265
4,550,276
4,550,304
4,550,330
4,550,344
4,550,382
4,550,396
4,550,416
37 : 4,549,331
4,549,367
4,549,376
4,549,558
4,549,576
4,549,662
4,549,679
4,549,759
4,549,875
4,550,186
38 : 4,549,498
39 : 4,549,379
4,549,424
4,549,425
4,549,481
4,549,483
4,549,503
4,549,525
4,549,544
4,549,611
4,549,638
4,549,650
4,549,665
4,549,667
4,549,723
4,549,747
4,549,786

4,549,865
4,549,888
4,549,896
4,549,943
4,550,037
4,550,132
4,550,181
4,550,210
4,550,303
4,550,323
4,550,418
4,550,442
40 : 4,549,565
4,549,580
4,549,630
4,549,702
4,549,829
4,549,934
4,549,945
4,549,948
4,550,013
4,550,097
4,550,212
4,550,263
41 : 4,549,604
4,549,613
4,549,663
4,549,783
4,549,879
42 : 4,549,317
4,549,337
4,549,343
4,549,390
4,549,547
4,549,557
4,549,615
4,549,655
4,549,671
4,549,691
4,549,727
4,549,822
4,549,878
4,549,903
4,549,914
4,549,946
4,549,968
4,549,981
4,549,993
4,550,060
4,550,090
4,550,117
4,550,137
4,550,139

4,550,172
4,550,219
4,550,231
4,550,246
4,550,284
4,550,380
4,550,439
44 : 4,549,524
4,550,189
45 : 4,549,880
4,549,980
4,550,088
46 : 4,549,529
47 : 4,549,411
4,549,538
4,549,561
4,549,711
4,549,954
4,550,050
4,550,292
4,550,412
48 : 4,549,336
4,549,342
4,549,345
4,549,366
4,549,382
4,549,408
4,549,410
4,549,426
4,549,427
4,549,431
4,549,499
4,549,568
4,549,570
4,549,578
4,549,608
4,549,634
4,549,635
4,549,698
4,549,754
4,549,790
4,549,810
4,549,820
4,549,836
4,549,867
4,549,916
4,549,966
4,550,011
4,550,022
4,550,045
4,550,075
4,550,109

49 : 4,549,464
4,549,787
50 : 4,549,439
51 : Re.32,013
Re.32,014
4,549,540
4,549,721
4,549,767
4,549,793
4,550,016
53 : 4,549,355
4,549,422
4,549,461
4,549,553
4,549,652
4,549,871
4,550,084
4,550,287
4,550,309
4,550,359
4,550,385
4,550,422
54 : 4,549,778
55 : 4,549,323
4,549,359
4,549,400
4,549,415
4,549,445
4,549,502
4,549,507
4,549,531
4,549,546
4,549,560
4,549,625
4,549,639
4,549,701
4,549,765
4,549,777
4,549,842
4,549,932
4,549,949
4,549,962
4,550,015
4,550,244
4,550,298
4,550,314
4,550,371

DESIGN PATENTS

04 : 281,196
06 : 281,121
281,140
281,141
281,142
281,143
281,148
281,150
281,155

281,193
281,195
281,197
281,199
13 : 281,168
281,194
17 : 281,137
281,164
281,198

18 : 281,147
19 : 281,187
24 : 281,156
25 : 281,122
281,174
26 : 281,191
27 : 281,163
281,173

29 : 281,116
281,117
34 : 281,119
281,146
281,176
36 : 281,115
281,124
281,126

281,127
281,128
281,129
281,130
281,131
281,132
281,133
281,134

281,159
281,160
281,177
37 : 281,125
39 : 281,167
47 : 281,169
48 : 281,123
51 : 281,120

PLANT PATENTS

06 : 5,577

5,578

U.S. GOVERNMENT PRINTING OFFICE : O—1985

CHANGE OF ADDRESS FORM

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

SUBSCRIPTION ORDER FORM

SUBSCRIPTION ORDER FORM

ENTER MY SUBSCRIPTION TO:

@ $ Domestic; @ $ Foreign.

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

☐ Remittance Enclosed (Make checks payable to Superintendent of Documents)

☐ Charge to my Deposit Account No. .....

MAIL ORDER FORM TO:
Superintendent of Documents
Government Printing Office
Washington, D.C. 20402

U.S. DEPARTMENT OF COMMERCE
Malcolm Baldrige, *Secretary*
PATENT AND TRADEMARK OFFICE
Donald J. Quigg, *Commissioner - Designate*